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SCOTT ENVIRONMENTAL TECHNOLOGY INC. PLUMSTEADVILLE PA
J57-59W ENGINE EMISSION TEST REPORT.(U)

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LEVEL II

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J57-59W Engine Emission Test Report

SCOTT ENVIRONMENTAL TECHNOLOGY, INCORPORATED
PLUMBSTEADVILLE, PENNSYLVANIA 18949

Anthony F Souza
Harold A Scott, Jr

JULY 1978



FINAL REPORT FOR PERIOD NOVEMBER 1976-DECEMBER 1977

Approved for public release; distribution unlimited

**CIVIL AND ENVIRONMENTAL
ENGINEERING DEVELOPMENT OFFICE**

(AIR FORCE SYSTEMS COMMAND)

TYNDALL AIR FORCE BASE

FLORIDA 32403

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)											
<table border="0"> <tr> <td>Gas Turbine Engines</td> <td>Air Pollution</td> <td>Carbon Monoxide</td> </tr> <tr> <td>Exhaust Emissions</td> <td>Smoke</td> <td>Total Hydrocarbons</td> </tr> <tr> <td>J57-59W</td> <td>Particulate</td> <td>Oxides of Nitrogen</td> </tr> </table>			Gas Turbine Engines	Air Pollution	Carbon Monoxide	Exhaust Emissions	Smoke	Total Hydrocarbons	J57-59W	Particulate	Oxides of Nitrogen
Gas Turbine Engines	Air Pollution	Carbon Monoxide									
Exhaust Emissions	Smoke	Total Hydrocarbons									
J57-59W	Particulate	Oxides of Nitrogen									
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)											
<p>The exhaust emissions from three J57-59W water injected turbojet engines were measured. Emission rates of hydrocarbons, carbon monoxide and oxides of nitrogen were calculated. Smoke opacity and particulate loading were also measured. Best estimate emission factors are presented.</p>											

PREFACE

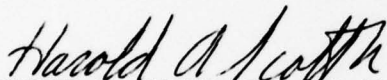
This report documents work performed during the period November 1976 through December 1977 by Scott Environmental Technology, Inc, Plumbsteadville PA 18949, under Contract FY8952-77-625 with Det 1 Armament Development and Test Center, Air Force Systems Command, Tyndall Air Force Base FL 32403. Lieutenant Harold A. Scott, Det 1 ADTC/ECA, managed the program.

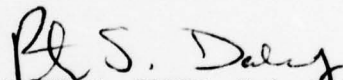
A special thanks is given to SMSgt John Hamilton and the 189th MAF, Arkansas National Guard, Little Rock Air Force Base AR for their outstanding support of this project.

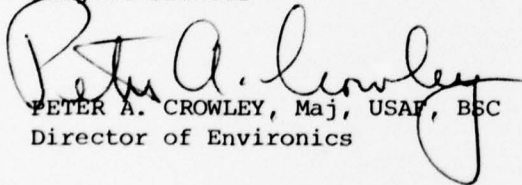
ALC William Burdick performed all Ringelmann opacity readings and compiled the data.

This report has been reviewed by the Office of Information (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This report is approved for publication.


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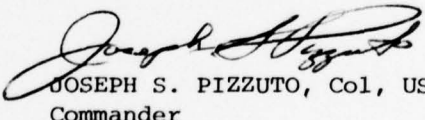

JOSEPH S. PIZZUTO, Col, USAF, BSC
Commander

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SECTION I

INTRODUCTION

In a program performed under Air Force Contract Number F08635-77-C-0216, Scott Environmental Technology, Inc., measured the exhaust emissions of three J57-59W engines. The tests were performed on two overhauled and one recently repaired engine at the Air National Guard Test Cell at Little Rock Air Force Base, Arkansas. The emission tests consisted of analysis of the exhaust gases, smoke level and particulate emissions. Smoke and gas analysis were performed using the Air Force Mobile Emissions Laboratory (MEL). The MEL is a state-of-the-art analysis system for turbine engine exhaust emissions measurement. It meets all the standards of the Environmental Protection Agency (40CFR87) and the SAE Aerospace Recommended Practice (ARP) 1256.

A traversing probe was used to collect exhaust samples from four centers of equal area located along an exhaust plane radius. The center point was also sampled for completeness. Complete traverses across the exhaust plume were not possible due to interferences between the traverse probe and the engine stand restraint system. The traverse probe sample inlets were located 1.23 meters downstream of the engine exhaust plane. The smoke transmissometer mounting frame was located 0.51 meters behind the engine exhaust plane. The smoke meter light beam was directed horizontally across the J57 exhaust plume. In addition, Ringelmann readings were made of the exhaust plume.

The emission tests were made at idle, intermediate, military and take-off power. The J57-59W uses water injection at take-off power. Emissions tests were performed during continuous engine operation at idle, intermediate and military power. Due to the restriction of running time at take-off power, the engine was returned to military in between five- minute power bursts to take-off power. One each power burst was used for each one of the five probe samples.

The engine tests are marked 4, 5, and 6 in the data to separate them from tests of a different engine model performed earlier in the program.

SECTION II

SUMMARY

As a result of the tests reported herein, the best estimate emission factors for the J57-59W engine have been determined. The factors for the gaseous and particulates emissions are the mean values for the three tests. Likewise, the smoke opacity data are the means for the three engines tested.

TABLE 2-1. J57-59W ENGINE EMISSION FACTORS
Gaseous Emissions

<u>Pollutant</u>	<u>Mode</u>	<u>Emission Index Grams Per Kilograms of Fuel</u>	<u>Emission Rate Kilograms Per Hour</u>
Total Hydrocarbons	Idle	52.90	29.89
	Int.	1.13	1.98
	Mil.	0.21	0.74
	T/O*	2.19	12.02
Carbon Monoxide	Idle	64.90	36.65
	Int.	8.85	15.47
	Mil.	2.37	8.53
	T/O*	21.10	116.12
Total Oxides of Nitrogen	Idle	2.38	1.36
	Int.	6.13	10.75
	Mil.	11.30	40.46
	T/O*	2.71	14.88

*Water augmentation was used in the T/O mode.

TABLE 2-2. J57-59W ENGINE EMISSION FACTORS
Particulate Emissions

<u>Pollutant</u>	<u>Mode</u>	Emission Index Grams Per Kilograms of Fuel	Emission Rate Kilograms Per Hour
Particulates	Mil.	10.43	2.27
	T/O*	123.83	19.05

*Water augmentation was used in the T/O mode.

TABLE 2-3. J57-59W ENGINE SMOKE OPACITY MEASUREMENTS

<u>Parameter</u>	<u>Mode</u>	<u>Smoke Opacity (%)</u>
Smoke Opacity	Idle	1
	Int.	5
	Mil.	8
	T/O*	18

*Water augmentation was used in the T/O mode.

SECTION III

EXHAUST EMISSION MEASUREMENTS

These measurements were performed by the techniques described in Reference 1 using the Air Force Mobile Emissions Laboratory (MEL) instrumentation and sampling systems. Figures 3-1 and 3-2 are photographs of the MEL and its interior. Figure 3-3 illustrates the MEL's location adjacent to the J57 test cell at Little Rock Air Force Base and Figure 3-4 shows the sample probe being aligned behind the test engine and the opacity meter framework location behind the engine. Calculation of gaseous emission rates was performed using the concentrations measured at the engine exhaust. The procedure is specified in SAE ARP 1256 (Reference 2). The emission rates of total hydrocarbon, carbon monoxide and total oxides of nitrogen were calculated from the exhaust concentrations measured at the various power levels tested. The emission rates of the total oxides of sulfur were calculated from the fuel analysis and fuel flow rates. Emission rates are reported in Emission Index (pounds per thousand pounds of fuel) and pounds per hour. The gas analysis data are contained in several computer generated reports which follow in the appendix. The first report called the Model Summary Report (Appendix A) is a statistical summary of the test results in an emission index format. Next are listed the Individual Engine Test Reports (Appendix B) which describe the test results obtained from each engine. The raw data which were used in calculating the results listed in the first two reports are contained in the remaining material in this section. These reports are: Mass Calculation; Engine Edit Report; Smoke Edit Report; and Concentration Edit Report (Appendices C through F).

Due to restrictions imposed on the traversing probe movement by the proximity of the engine test stand restraining harness, only the lower right hand quadrant of the engine exhaust plane (observer facing upstream) could be sampled. Four sample points at centers of equal area plus the engine center point were sampled. The traversing probe was located 1.23 meters behind the engine exhaust plane.

3.0 Description Of Data

All the data of tests 4 and 5 are mass flow weighted. The data of test 6 are area weighted since no exhaust gas temperatures were available for use in calculating exhaust gas flow rates. This was caused by a failure of the exhaust gas thermocouple which went undetected during the test run.

Ref. 1 Air Force Emissions Survey, Scott Environmental Technology, Inc., August 1977, Report Number 1492-50-08-77

Ref. 2 Procedure for the Continuous Measurement of Gas Turbine Exhaust Emissions - Society of Automotive Engineers, ARP 1256.

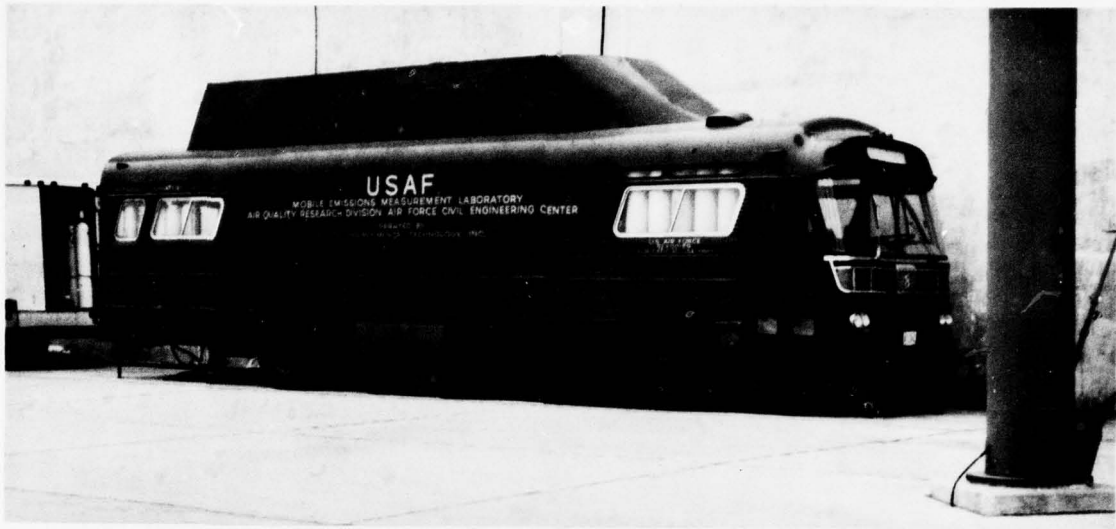


Figure 3-1. Photograph of MEL



Figure 3-2. Photograph of MEL Interior

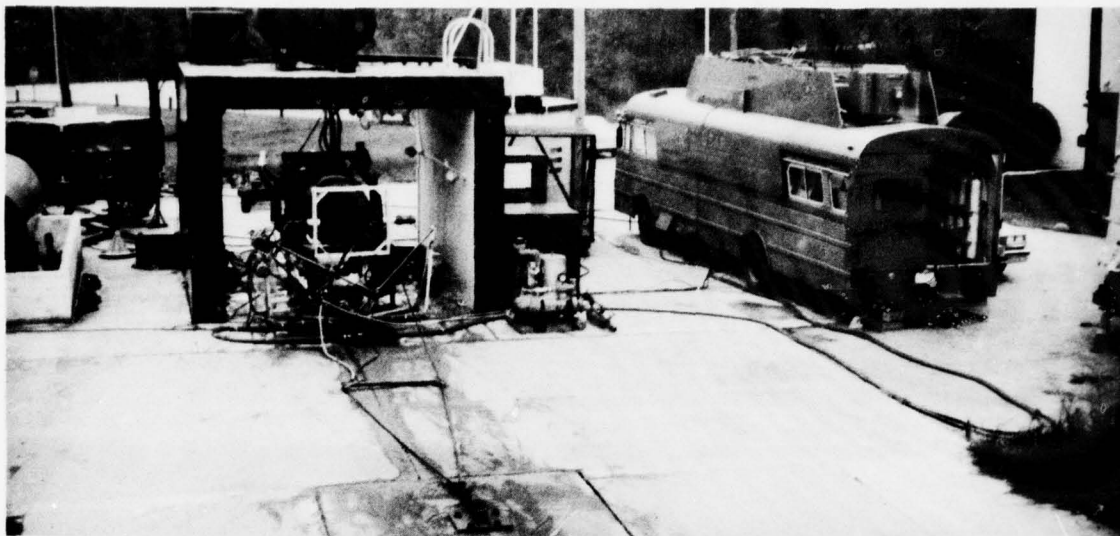


Figure 3-3. MEL Adjacent to J57 Test Cell

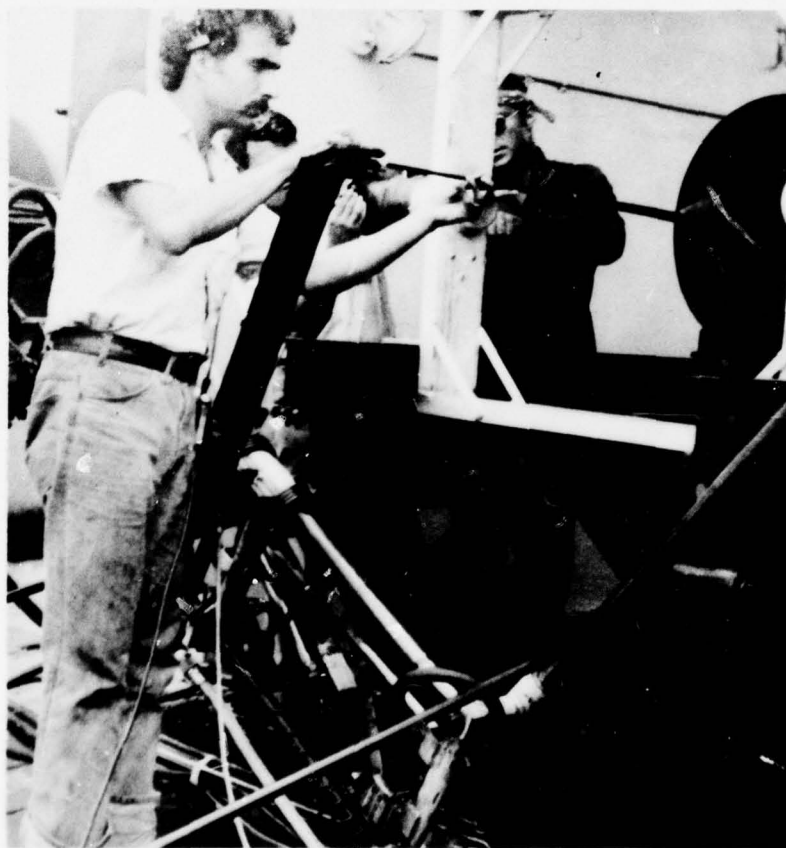


Figure 3-4. Sample Probe and Opacity Meter Installed Behind J-57 Test Engine

The variations in the data are typical for turbine engine tests. A larger sample would have produced a more statistically significant result. The results for the main pollutants of interest; total hydrocarbons, carbon monoxide, and total oxides of nitrogen, are quite consistent from engine to engine. Total hydrocarbons at military power always show significant variation mostly because the emission levels are very low and a change in a few parts per million of hydrocarbon concentration changes the emission index several percent.

SECTION IV

PARTICULATE MEASUREMENTS

Particulate loading measurements of the J57 exhaust were made at military and take-off power setting. The technique used conformed to Environmental Protection Agency Method 5 as published in 40CFR 23 December 1971. The condensible fraction was determined using the method of LAAPCD Source Testing Manual, December 1972.

The particulate sampling system is illustrated in Figure 4-1. A special particulate probe was fashioned from one-fourth inch OD stainless steel tubing bent so that the inlet end of the tube faced into the jet exhaust. The particulate probe inlet was positioned halfway between the smoke probe and the gas probe inlets on the traversing probe. A constant flow rate was drawn into the particulate system using a Scott Model 100 sampling system which conforms to the specifications of EPA Method 5. The sample rate of approximately 0.35 liters/second was set by adjusting ΔH to 4.57 centimeters of water differential.

Table 4-1 lists the results of the particulate measurements. It was not possible to calculate the particulate emission rates for test 6 due to the missing exhaust volume rates. The particulate emission rates were calculated from the measured particulate loadings and the measured exhaust volume flow rates. The following equations were used:

$$\text{Exhaust Volume Flow Rate (l/s)} = \overline{\rho V} A g \times 2.17 \text{ l/kg} = \dot{V} \quad (1)$$

$$\text{Emission Rate (kg/hr)} = \frac{\text{mg}}{\text{l}} \times \frac{1.0g}{1000\text{mg}} \times \dot{V} \times 3600 \text{ s/hr} \quad (2)$$

$$\text{Emission Rate (g/kg)} = \frac{\text{g/hr emission}}{\text{kg/hr fuel}} \quad (3)$$

Where: $\overline{\rho V}$ is the mass weighting parameter and has the units kg-s/m^3

A is the nozzle area (0.30 m^2)

g is the gravitational constant 9.81 m/s^2

\dot{V} is the exhaust volume flow rate l/s

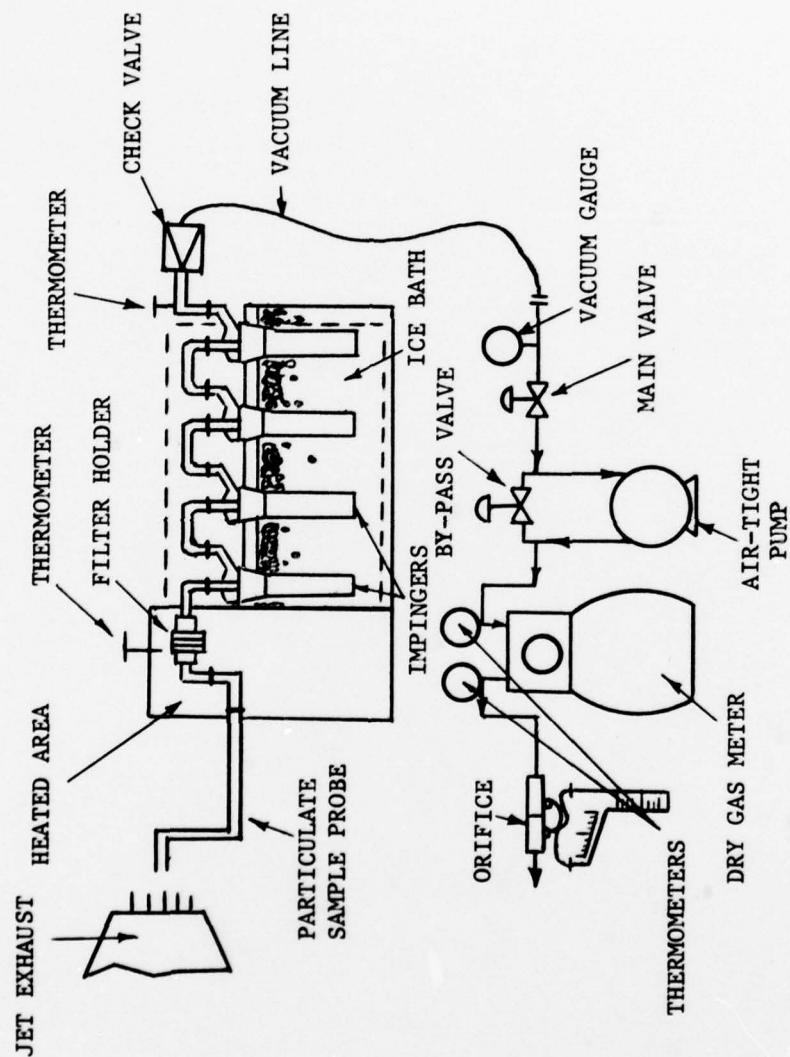


Figure 4-1. Particulate Sampling System

TABLE 4-1. PARTICULATE SUMMARY
J57-59W ENGINE TESTS, LITTLE ROCK AFB, SEPTEMBER 1977

Test No.	4		5		6	
	MIL	T/O	MIL	T/O	MIL	T/O
Acetone Front Fraction - mg	3.00	4.3	3.1	3.5	13.4	6.9
Filter Fraction - mg	10.9	56.6	27.3	59.2	24.8	84.2
Total Front - mg	13.9	60.9	30.4	62.7	38.2	91.1
Organic Extract Fraction - mg	11.9	11.9	13.1	2.4	12.7	11.5
Water Residue Fraction - mg	14.5	6.0	13.0	3.7	18.7	3.4
Total Back - mg	26.4	17.9	26.1	6.1	31.4	14.9
Total - mg	40.3	78.8	56.5	68.8	69.6	106.0
<u>Sample Volume</u>						
Measured Vol. - Cu Ft	10.663	4.618	8.743	4.316	8.794	4.413
Wet Test Meter Temp. - °R	537.1	538.1	534.2	540.6	533.5	537.1
Barometric Press. - ΔHg	29.91	29.91	29.70	29.70	29.70	29.70
ΔH Orifice Press. Drop - ΔHg	1.6	1.8	1.8	1.8	1.8	1.8
Sample Vol. - scf*	10.56	4.566	8.647	4.218	8.709	4.341
<u>Water Content</u>						
Final Vol of H ₂ O Impinger						
+ Silica Gel - ml	176.2	221.8	215.9	245.6	186.2	217.5
Initial Vol. of H ₂ O - ml	200	200	200	200	200	200
Vol. of H ₂ O Collected - ml	-23.8	21.8	15.9	45.6	-13.8**	17.5
% Moisture in Exhaust	--	18.5	8.02	33.9	--	16.04
Particulate Loading mg/scf	1.31	13.34	3.52	14.86	4.39	20.99
Organic Exhaust Fraction mg/scf	1.13	2.61	1.51	0.57	1.46	2.65
Residual H ₂ O Fraction mg/scf	1.37	1.31	1.50	0.88	2.15	0.78
Total Emission - mg/scf	3.82	17.3	6.53	16.3	7.99	24.4

* 29.92 inches Hg, 70°F

** Accidental water loss (occurred after test)

TABLE 4-1. PARTICULATE SUMMARY
J57-59W ENGINE TESTS LITTLE ROCK AFB, SEPTEMBER 1977 (continued)

Test No.	4		5		6	
	MIL	T/O	MIL	T/O	MIL	T/O
<u>% of Total by Weight</u>						
Solvent Solubles	29.5	15.1	23.2	3.5	18.2	10.9
Water Solubles	36.0	7.6	23.0	5.4	26.9	3.2
Filtrate	34.5	77.3	53.8	91.1	54.9	85.9
	100	100	100	100	100	100

Emission Rates

Particulate #/hr	22.73	249.28	60.55	297.38	*	*
Particulate #/K# fuel	2.88	20.8	7.66	24.2	*	*

* Exhaust volume flow not measured

SECTION V

SMOKE OPACITY

The smoke opacity of the J57-59W test engines was measured using a Wager Model P5 Smoke Transmissometer. The smoke meter was mounted so as to measure horizontally across the exhaust plane at a point 50.8 cm aft of the exhaust nozzle. Table 5-1 contains the smoke density readings obtained on the three J57-59W engines tested. Zero opacity corresponds to no attenuation of the light beam and 100 percent opacity would be complete obscuration of the light beam.

TABLE 5-1. SMOKE TRANSMISSOMETER READINGS

<u>Test No.</u>	<u>Power Mode</u>	<u>Percent Smoke Opacity</u>
4	Idle	1
	Int	4
	Mil	9
	T/O	17
5	Idle	1
	Int	5
	Mil	8
	T/O	17
6	Idle	1
	Int	-
	Mil	7.5
	T/O	19

SECTION VI

DISCUSSION OF RESULTS

The injection of water into the J57-59W results in higher carbon monoxide, hydrocarbon, and particulate emissions rates. Oxides of nitrogen emissions are decreased by the water augmentation. The variations in emissions over the military thrust mode are very significant. Table 6-1 presents the percentage changes in emissions between the military and water augmentation modes.

The drastic changes in emissions are caused by the water being injected in front of the engine's primary compressor turbines. The injection of water quenches the combustion reaction thereby inhibiting formation of nitrogen oxides and complete combustion of the fuel. This quenching is clearly demonstrated by the fact that the water augmented exhaust temperature is only 2°C higher than that in military, in spite of a 56 percent greater fuel flow. The net result is an increase in carbon monoxide and hydrocarbons and a decrease in oxides of nitrogen emissions. There is also an increase in particulate emissions because of the addition of the particulate matter from the water and collection of some of the additional hydrocarbons as particulate matter.

Water augmentation also increases the opacity of the J57-59W engine's plume. The opacity of the plume was measured by a transmissometer and a Ringelmann reader. The results from the transmissometer data are much lower than the Ringelmann opacity readings (Table 6-2). This was because the Ringelmann readings were taken after condensation of steam in the plume began to occur. Therefore, the transmissometer indicated a lower opacity measurement than the plumes maximum opacity. Smoke Number measurements were also taken and are shown in Table 6-2.

Table 6-2 presents the means for smoke number, transmissometer and Ringelmann data. The percent change between military and water augmentation is calculated for each type of measurement. The relative increases indicate major increases in both particulate emissions and smoke using water injection.

In conclusion, the results indicate that water augmentation causes increases in almost all emissions except oxides of nitrogen which are lower. These factors are "best estimates" and should be used for environmental assessments.

TABLE 6-1. RELATIVE EMISSIONS INCREASES FROM
WATER AUGMENTATION J57-59W

<u>Pollutant</u>	<u>Emissions (kg/hr)</u>		<u>Percent Increase (Decrease)</u>
	<u>Military</u>	<u>Water Augmentation</u>	
Carbon Monoxide	8.5	116.30	1264
Hydrocarbons	0.7	12.0	1556
Oxides of Nitrogen	40.5	14.9	(63)
Particulates	18.9	124.0	557

TABLE 6-2. J57-59W OPACITY AND SMOKE NUMBER MEASUREMENTS

<u>Type of Measurement</u>	<u>Military</u>	<u>Water Augmentation</u>	<u>Percent Increase</u>
Transmissometer (percent opacity)	8.2	18.0	120
Ringelmann (percent opacity)	15.5	45.5	194
S.A.E. Smoke Number	43.0	62.4	45

APPENDIX A
MODEL SUMMARIES

Part of:

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REDUCE PAGES

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INALS

1628

ENGINES

9W ENGINES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
ENGINE MODEL SUMMARY REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

ENGINE MODEL = J57-59W

TEST LOCATION : LRAFB, ARK.

ENGINE 2, PAGE 1

***** CATEGORY B TESTS ONLY *****

EXHAUST MASS EMISSION INDICES :

PARAM	TEST MODE	NO. OBS	# / 1000# FUEL					# / HR				
			MAX VALUE	MIN VALUE	MEAN	STND DEV	% COEF VAR	MAX VALUE	MIN VALUE	MEAN	STND DEV	% COEF VAR
THC	IDLE	3	69.01	38.17	52.91	15.464	29.23	86.26	49.62	65.92	18.652	28.30
	INTERMED. MILITARY	3	1.37	0.74	1.13	0.339	30.05	5.35	2.81	4.37	1.366	31.25
	TAKE-OFF	3	0.45	0.05	0.21	0.214	103.36	3.57	0.37	1.64	1.701	103.93
CO	TAKE-OFF	3	2.65	1.95	2.19	0.401	18.35	31.85	23.72	26.51	4.629	17.46
	IDLE	3	72.84	50.63	64.93	12.407	19.11	91.1	65.8	80.8	13.31	1.65
	INTERMED. MILITARY	3	11.27	6.75	8.85	2.278	25.75	42.8	26.3	34.1	8.29	2.43
NOX	TAKE-OFF	3	2.92	2.04	2.37	0.477	20.11	23.1	16.1	18.8	3.79	2.02
	TAKE-OFF	3	22.70	18.88	21.12	1.994	9.44	274.6	226.6	256.4	26.00	1.01
	IDLE	3	2.40	2.35	2.38	0.026	1.11	3.11	2.88	2.98	0.119	4.01
NO	INTERMED. MILITARY	3	6.44	5.60	6.13	0.464	7.56	25.13	21.27	23.73	2.137	9.01
	TAKE-OFF	3	12.03	10.48	11.29	0.778	6.89	95.06	82.79	89.22	6.157	6.90
	TAKE-OFF	3	3.32	2.36	2.71	0.533	19.68	39.86	28.57	32.80	6.156	18.77
NO2	IDLE	3	0.57	0.19	0.35	0.199	57.28	0.71	0.25	0.43	0.244	56.26
	INTERMED. MILITARY	3	4.87	3.89	4.51	0.537	11.91	18.97	14.78	17.43	2.307	13.24
	TAKE-OFF	3	10.56	9.24	9.95	0.665	6.68	83.45	72.97	78.57	5.277	6.72
NO2	TAKE-OFF	3	1.52	1.46	1.49	0.030	2.01	18.33	17.65	18.08	0.374	2.07
	IDLE	3	2.21	1.78	2.04	0.227	11.14	2.87	2.23	2.55	0.320	12.57
	INTERMED. MILITARY	3	1.71	1.49	1.63	0.122	7.46	6.58	5.81	6.29	0.421	6.69
SOX	TAKE-OFF	3	1.47	1.24	1.35	0.116	8.61	11.61	9.82	10.65	0.902	8.47
	TAKE-OFF	3	1.80	0.90	1.22	0.506	41.57	21.60	10.91	14.72	5.972	40.58
	IDLE	3										
SOX	IDLE	3	1.82	1.20	1.42	0.344	24.20					
	INTERMED. MILITARY	3	5.32	3.90	4.37	0.820	18.75					
	TAKE-OFF	3	11.05	7.89	8.94	1.824	20.40					
SOX	TAKE-OFF	3	16.78	12.09	13.72	2.652	19.33					
	TAKE-OFF	3										
	TAKE-OFF	3										

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APPENDIX B
INDIVIDUAL ENGINE TEST REPORTS

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
INDIVIDUAL ENGINE TEST REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

SCOTT TEST NUMBER 4, TYPE B

TEST DATE : 9/ 6/77

ENGINE 2, NUMBER 1

ENGINE TYPE & MODEL : J57-59W
ENGINE SERIAL # : P630584
TOTAL ENGINE TIME : 0 HRS.
PERFORMANCE TEST RESULTS : PASS

TEST LOCATION : LRAE - ARK.
TEST CELL NUMBER : NC
TEST CELL OPERATOR : WM
SCOTT SUPERVISOR : FL
INSTRUMENT OPERATOR : PR
SMOKE OPERATOR : DO

AIR FLOW MEASUREMENT METHOD : NONE

TEST ENVIRONMENTAL CONDITIONS :
TEST TIME (MIN-TIME) : START FINISH
INLET AIR TEMP (DEG.F) : 1350 1600
ATMOSPHERIC PRESS (IN.HG) : 89.0 89.0
RELATIVE HUMIDITY (%) : 29.58 29.58
INLET AIR HUMIDITY : 64 64
(GM H2O/GM DRY AIR) : 0.0190 0.0190

SAMPLE LINE :
FLOW RATE : 23 LPM
TEMPERATURE : 300 DEG.F
LENGTH : 100 FT.

FUEL ANALYSIS :
SAMPLE # : 4
TYPE : JP-4
WT.% CARBON : 85.55
WT.% HYDROGEN : 14.30
WT.% SULFUR : 0.07
H/C RATIO-ATM : 2.01
C/H RATIO-MASS : 5.98

TEST MODE	RATED POWER	THRUST #	FUEL FLOW #/HR	AIR FLOW #/HR	F/A ACT	F/A CALC	EPR	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	*-- SMOKE --*
IOLE	2	200	1300			.006		379.28	288.1	1.07	8.29	0.65	7.64	4.75
INTERMED.	40	3750	3800			.007	1.500	9.69	84.4	1.49	25.53	17.73	7.79	25.75
MILITARY	100	9190	7900			.011	2.300	8.65	23.7	2.18	69.94	61.64	8.29	43.88
TAKE-OFF	125	11400	12000			.016	2.790	73.84	300.9	3.14	32.22	14.76	17.46	66.13

EXHAUST MASS EMISSION INDICES :

-- # / 1000# FUEL --			*-- # / HR --*		
THC	CO	NOX	THC	CO	NOX
38.17	50.63	2.39	49.62	65.8	3.11
0.74	11.27	5.60	2.81	42.8	21.27
0.45	2.16	10.48	3.57	17.1	82.79
2.65	18.88	3.32	31.85	226.6	39.86

** AVERAGE CONCENTRATION AND MASS EMISSION DATA ARE MASS-WEIGHTED.

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SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
INDIVIDUAL ENGINE TEST REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0210

SCOTT TEST NUMBER 5, TYPE B

TEST DATE : 9/ 7/77

ENGINE 2, NUMBER 2

ENGINE TYPE & MODEL : J57-59W

ENGINE SERIAL # : P634272

TOTAL ENGINE TIME : 0 HRS.

PERFORMANCE TEST RESULTS : PASS

AIR FLOW MEASUREMENT METHOD : NONE

TEST LOCATION : LRAFB - ARK.

TEST CELL NUMBER : NG

TEST CELL OPERATOR : WM

SCOTT SUPERVISOR : FL

INSTRUMENT OPERATOR : PR

SMOKE OPERATOR : 00

TEST ENVIRONMENTAL CONDITIONS :

START

TEST TIME (MIL-TIME) : 1410

INLET AIR TEMP.(DEG.F) : 87.0

ATMOSPHERIC PRESS.(IN.HG) : 29.70

RELATIVE HUMIDITY (%) : 63

INLET AIR HUMIDITY -

(GM H2O/GM DRY AIR) : 0.0176

SAMPLE LINE :

FLOW RATE : 23 LPM

TEMPERATURE : 300 DEG.F

LENGTH : 100 FT.

FUEL ANALYSIS :

SAMPLE # : 5

TYPE : JP-4

WT.% CARBON : 85.53

WT.% HYDROGEN : 14.62

WT.% SULFUR : 0.05

H/C RATIO-ATM.: 2.05

C/H RATIO-MASS: 5.85

TEST MODE	RATED POWER %	THRUST #	FUEL FLOW #/HR	AIR FLOW #/HR	F/A ACT	F/A CALC	EPR	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	*--- SMOKE ---* SN	N/A
IDLE	2	250	1250			.005		632.30	382.2	0.94	7.51	1.81	5.69	8.38	0.0233
INTERMED.	40	3460	3900			.007	1.500	16.30	49.6	1.46	28.43	21.76	6.67	30.50	0.0233
MILITARY	100	9090	7900			.011	2.310	0.91	22.7	2.22	81.64	71.66	9.97	43.38	0.0233
TAKE-OFF	125	11580	12300			.016	2.790	55.92	358.2	3.23	24.39	14.92	9.47	67.38	0.0233

EXHAUST MASS EMISSION INDICES :

	THC	CO	CO2	# / 1000# FUEL	NO	NO2	THC	CO	CO2	NOX	NO	NO2	SOX
IDLE	69.01	72.84	2823	2.35	0.57	1.78	86.26	91.1	3528	2.94	0.71	2.23	1.25
INTERMED.	1.27	6.75	3112	6.36	4.87	1.49	4.95	26.3	12138	24.79	18.97	5.81	3.90
MILITARY	0.05	2.04	3123	12.03	10.56	1.47	0.37	16.1	24673	95.06	83.45	11.61	7.89
TAKE-OFF	1.95	21.78	3087	2.44	1.49	0.95	23.95	267.6	37469	29.96	18.33	11.64	12.29

** AVERAGE CONCENTRATION AND MASS EMISSION DATA ARE MASS-WEIGHTED.

SCOTT ENVIRONMENTAL-TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
INDIVIDUAL ENGINE TEST REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

SCOTT TEST NUMBER 6, TYPE B

TEST DATE : 9/ 8/77

ENGINE 2, NUMBER 3

ENGINE TYPE & MODEL : J57-59W
ENGINE SERIAL # : P634817
TOTAL ENGINE TIME : 1759 HRS.
PERFORMANCE TEST RESULTS : PASS

TEST LOCATION : LRAFB - APK.
TEST CELL NUMBER : NG
TEST CELL OPERATOR : WM
SCOTT SUPERVISOR : FL
INSTRUMENT OPERATOR : PR
SMOKE OPERATOR : AS

AIR FLOW MEASUREMENT METHOD : NONE

TEST ENVIRONMENTAL CONDITIONS :
TEST TIME (MIL.TIME) : START FINISH
INLET AIR TEMP.(DEG.F) : 1315 1500
ATMOSPHERIC PRESS.(IN.HG) : 88.0 29.70
RELATIVE HUMIDITY (%) : 55 55
INLET AIR HUMIDITY -
(6M H2O/GM DRY AIR) : 0.0159 0.0159

SAMPLE LINE :
FLOW RATE : 23 LPM
TEMPERATURE : 300 DEG.F
LENGTH : 100 FT.

FUEL ANALYSIS :
SAMPLE # : 6
TYPE : JP-4
WT.% CARBON : 85.59
WT.% HYDROGEN : 14.28
WT.% SULFUR : 0.05
H/C RATIO-ATP.: 2.00
C/H RATIO-MASS: 5.99

TEST MODE	RATED POWER	THRUST #	FUEL FLOW #/HR	AIR FLOW #/HR	F/A ACT	F/A CALC	EPR	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	*--- SMOKE ---* SN W/A
IOLE	2	200	1200			.005		480.64	380.8	0.98	7.80	0.92	6.88	6.50 0.0232
INTERMED.	40	4570	3900			.006	1.500	15.90	56.5	1.32	26.02	19.21	6.81	34.13 0.0232
MILITARY	100	9720	7900			.010	2.280	2.12	28.9	1.98	68.64	60.60	8.04	41.75 0.0232
TAKE-OFF	125	13160	12100			.017	2.780	57.93	384.1	3.33	24.32	15.03	9.29	53.75 0.0232

EXHAUST MASS EMISSION INDICES :

-----# / 1000# FUEL-----				*-----# / HR-----*			
THC	CO	CO2	NOX	THC	CO	CO2	NOX
51.56	71.32	2884	2.40	61.87	85.6	3461	2.88
1.37	8.52	3121	6.44	5.35	33.2	12170	25.13
0.12	2.92	3133	11.37	0.97	23.1	24749	89.82
1.96	22.70	3097	2.36	23.72	274.6	37470	28.57
							17.65
							10.91
							1.20
							3.90
							7.89
							12.09

** AVERAGE CONCENTRATION AND MASS EMISSION DATA ARE AREA-WEIGHTED.

3FIN

STOP REPORT

APPENDIX C
MASS DATA CALCULATIONS

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1626-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** START RUN *****

ENGINE TYPE : J57-59W
BP : 29.58 IN.HG
TEST TYPE : B
FUEL : 89.0 DEG.F
FUEL : # 4 - JP-4
H/C RATIO(ATM) : 2.01
FUEL SULFUR : .07 %

***** MODE 1 - IDLE (THRUST = 200 #) *****

* SAMPLE POINT * NO LOCATION	TEMP. DEG.F	PTOT PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	*--- SMOKE ---*	
												SN	N/A
1	320.8	14.5	.0000	.00	.0000	236.73	278.64	.69	5.57	.99	4.58	3.00	.0232
2	381.2	15.3	.0015	388.70	.5665	347.65	261.04	.89	6.74	.69	6.05	5.50	.0232
3	461.2	15.6	.0014	471.54	.6375	439.97	309.39	1.10	8.51	.69	7.82	5.00	.0232
4	525.0	15.8	.0013	529.01	.6712	348.32	290.74	1.19	9.40	.59	8.81	5.50	.0232
5	523.2	15.5	.0013	464.83	.5876	347.09	283.66	1.16	9.22	.52	8.70	12.00	.0232
AVERAGE = NUM. MASS-WGHTD.	422.1	15.3	.0014	461.75	.6251	343.17	284.95	.97	7.55	.74	6.81	4.75	.0232
						379.28	288.11	1.07	8.29	.65	7.64		

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .005 , MASS-WGHTD. = .006

MASS EMISSIONS :

	--- THC ---		*--- CO ---*		*--- NOX ---*		*--- NO ---*		*--- NO2 ---*		* SOX *	
	#/1000#	#/HR	#/1000#	#/HR	#/1000#	#/HR	#/1000#	#/HR	#/1000#	#/HR	#/1000#	#/HR
AREA-WGHTD.	38.06	49.48	55.19	71.7	2944.	3828.	2.40	.31	2.17	2.82		1.82
MASS-WGHTD.	38.17	49.62	50.63	65.8	2951.	3837.	2.39	.25	2.21	2.87		1.82

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN *****

ENGINE TYPE : J57-S9W
BP : 29.58 IN.HG
IAT : 89.0 DEG.F
FUEL : # 4 - JP-4
ENGINE SN : P630584
H/C RATIO(ATM) : 2.01
TEST TYPE : B
FUEL SULFUR : .072

***** MODE 3 - INTERMED. (THRUST = 3750 #) *****

PT1 = .00 IN.H2O
EPR = .000
PT2 = .00 IN.H2O
FUEL FLOW = 3800. #/HR
PS2 = .00 IN.H2O
AIR FLOW =
PT3 = 29.3 PSIG
O. #/HR
ACTUAL F/A RATIO = .000

SAMPLE POINT #	TEMP. DEG.F	PTOT PSIA	DENS. (RH0)	EXH.VEL FT/SEC	MASS FL. (RH0*V)	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	N2 PPM	SMOKE
NO	LOCATION											N/A
1	.	423.9	16.0	536.89	.7620	12.65	51.43	1.04	16.56	11.82	4.74	30.00
2	.	532.1	18.2	861.60	1.1295	10.44	57.73	1.38	23.11	15.95	7.16	4.00
3	.	656.0	20.5	1120.75	1.3490	14.11	121.55	1.67	29.05	19.31	9.74	37.00
4	.	702.2	20.9	1173.93	1.3636	3.04	88.27	1.64	29.05	20.96	8.09	32.00
5	.	675.8	19.9	1082.99	1.2701	.10	70.55	1.50	26.34	19.56	6.78	40.50
AVERAGE : NUM.		578.6	18.9	923.29	1.1510	10.06	79.75	1.43	24.44	17.01	7.43	25.75
MASS-WGHTD.						9.69	84.43	1.49	25.53	17.73	7.79	.0232

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .007 * MASS-WGHTD. = .007

MASS EMISSIONS :

THC	CO	CO2	NOX	NO	N2	SOX
#/1000#	#/1000#	#/1000#	#/1000#	#/1000#	#/1000#	#/HR
.80	11.04	3116.	5.56	3.87	1.69	5.32
.74	11.27	3116.	5.60	3.89	1.71	5.32

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN 4 *****

ENGINE TYPE : J57-59H BP : 29.58 IN.HG IAT : 89.0 DEG.F FUEL : # 4 - JP-4 FUEL SN : P630584 TEST TYPE : B FUEL SULFUR : .07 %
H/C RATIO(ATM) : 2.01 ACTUAL F/A RATIO : .000

***** MODE 4 - MILITARY (THRUST = 9190 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PS2 = .00 IN.H2O PT3 = 44.8 PSIG PT5/7 = 68.2 IN.HG
EPR = .000 FUEL FLOW = 7900. #/HR AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

SAMPLE POINT NO LOCATION	TEMP. DEG.F	PTOT PSIA	DENS. (RHO)	EXH-VEL FT/SEC	MASS FL. (RHO*V)	THC PPHC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	SMOKE SN	W/A
1	605.8	18.8	.0012	953.13	1.1731	.00	15.11	1.58	46.16	43.19	2.97	40.50	.0232
2	786.3	23.3	.0011	1375.61	1.5343	10.61	19.89	2.11	65.38	59.36	6.02	43.00	.0232
3	961.8	28.6	.0010	1734.74	1.7976	7.80	25.97	2.48	79.68	68.98	10.70	47.00	.0232
4	1002.3	30.3	.0010	1825.85	1.8683	7.67	30.05	2.34	79.23	68.04	11.19	45.00	.0232
5	956.8	27.3	.0010	1676.34	1.7209	6.25	37.04	2.02	67.21	57.75	9.46	48.00	.0232
AVERAGE : NUM.	839.0	25.2	.0011	1472.53	1.5933	8.76	22.75	2.13	67.61	59.89	7.72	43.87	.0232
MASS-WGHTD.						6.65	23.70	2.18	69.94	61.64	8.29		

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .010 , MASS-WGHTD. = .011

MASS EMISSIONS :

	THC #/1000#	CO #/1000#	CO2 #/1000#	NOX #/1000#	NO #/1000#	NO2 #/1000#	SOX #/HR
AREA-WGHTD.	.47	3.71	3131.	10.40	9.21	72.79	1.19
MASS-WGHTD.	.45	3.57	3131.	10.48	9.24	72.97	1.24
							9.38
							11.05
							11.05

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN *****

ENGINE TYPE : J57-S9N ENGINE SN : P630584 TEST TYPE : R
BP : 29.58 IN.HG IAT : 89.0 DEG.F FUEL : 4 - JP-4 H/C RATIO(ATM) : 2.01 FUEL SULFUR : .07 %

***** MODE 5 - TAKE-OFF (THRUST = 11400 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PS2 = .00 IN.H2O PT3 = 44.3 PSIG PT5/7 = 82.0 IN.HG
EPR = .000 FUEL FLOW = 12000. #/HR AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

* SAMPLE POINT #	TEMP. DEG.F	PTOT PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	SMOKE W/A
1	727.8	21.3	.0011	1215.80	1.3889	3.45	236.80	2.37	65.64	30.78	34.86	71.00
2	884.4	26.3	.0011	1589.04	1.6964	95.44	324.20	2.97	19.02	8.29	10.73	65.00
3	1032.0	32.5	.0010	1921.47	1.9639	113.44	356.88	3.60	24.51	9.89	14.62	64.00
4	1041.3	30.8	.0010	1868.78	1.8699	64.95	268.39	3.39	27.46	13.85	13.61	64.50
AVERAGE : NUM.	921.4	27.7	.0011	1648.77	1.7298	69.32	296.57	3.08	34.16	15.70	18.45	66.12
MASS-WGHTD.						73.84	300.85	3.14	32.22	14.76	17.46	.0232

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .015 , MASS-WGHTD. = .016

MASS EMISSIONS :

	THC #/1000#	CO #/1000#	CO2 #/1000#	NOX #/1000#	NO #/1000#	NO2 #/1000#	SOX #/HR
AREA-WGHTD.	2.54	30.48	18.97	227.7	3099.	37185.	
MASS-WGHTD.	2.65	31.85	18.88	226.6	3099.	37162.	
				3.59	43.08	1.65	19.80
				3.32	39.86	1.52	18.26
						1.94	23.27
						1.80	21.60
							16.78
							16.78

* MID-POINT - NOT INCLUDED IN AVERAGES

***** END RUN *****

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT FOR 635-77-0216

***** S T A R T R U N 5 *****

ENGINE TYPE : J57-59H ENGINE SN : P634272 TEST TYPE : B
BP : 29.70 IN.HG IAT : 87.0 DEG.F FUEL : # 5 - JP-4 H/C RATIO(ATM) : 2.05 FUEL SULFUR : .05 %

***** MODE 1 - IDLE (1 THRUST = 250 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PS2 = .00 IN.H2O PT3 = 16.7 PSIG PT5/7 = 32.5 IN.HG
EPR = .000 FUEL FLOW = 1250. #/HR AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

* SAMPLE POINT *	TEMP. DEG.F	PTOT PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPMC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	SN	SMOKE	W/A
1	308.6	14.9	.0016	235.75	.3782	403.75	235.97	.66	5.38	2.56	2.82	12.00	.0233	
2	393.1	15.2	.0015	345.65	.5024	566.79	327.08	.82	6.57	1.86	4.71	6.00	.0233	
3	466.6	15.5	.0013	437.00	.5880	768.54	439.74	1.04	7.99	1.59	6.40	7.00	.0233	
4	532.9	15.7	.0013	497.48	.6268	694.91	460.60	1.12	9.09	1.54	7.55	8.50	.0233	
5	547.0	15.4	.0012	430.79	.5323	530.53	423.17	1.16	9.57	1.47	8.10	6.50	.0233	
AVERAGE : NUM.	425.3	15.3	.0014	378.97	.5239	608.50	365.85	.91	7.26	1.89	5.37	8.37	.0233	
MASS-WGHTD.						632.30	382.19	.94	7.51	1.81	5.69			

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .005 , MASS-WGHTD. = .005

MASS EMISSIONS :

	THC #/1000#	#/HR	CO #/1000#	#/HR	CO2 #/1000#	#/HR	NOX #/1000#	#/HR	NO #/1000#	#/HR	NO2 #/1000#	#/HR	SOX #/HR
AREA-WGHTD.	68.83	86.03	72.26	90.3	2824.	3530.	2.35	2.94	.61	.77	1.74	2.18	1.25
MASS-WGHTD.	69.01	86.26	72.84	91.1	2823.	3528.	2.35	2.94	.57	.71	1.78	2.23	1.25

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN 5 *****

ENGINE TYPE = J57-59N BP : 29.70 IN.HG IAT : 87.0 DEG.F FUEL : # 5 - JP-4 H/C RATIO(ATM) : 2.05 FUEL SULFUR : .05 %
ENGINE SN : P634272 TEST TYPE : B

***** MODE 4 - MILITARY (THRUST = 9090 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PS2 = .00 IN.H2O PT3 = 43.5 PSIG PT5/7 = 68.8 IN.HG
EPR = .000 FUEL FLOW = 7900. #/HR AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

SAMPLE POINT #	TEMP. DEG.F	PTOT PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPHC	CO FPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	SMOKE SN	W/A
1	635.3	19.3	.0012	1005.52	1.2164	1.34	13.19	1.63	56.28	51.94	4.34	37.00	.0233
2	798.1	23.2	.0011	1370.66	1.5169	1.27	19.58	2.15	74.79	69.67	5.12	43.50	.0233
3	973.7	28.5	.0010	1733.15	1.7843	.32	26.84	2.55	97.13	81.57	15.56	46.00	.0233
4	1011.7	30.1	.0010	1819.75	1.8519	.00	27.57	2.33	88.97	76.71	12.26	47.00	.0233
5	980.4	27.4	.0010	1689.92	1.7126	.00	26.31	2.10	60.47	70.74	9.73	50.50	.0233
AVERAGE = NUM.	854.7	25.3	.0011	1482.27	1.5924	.98	21.79	2.16	79.29	69.97	9.32	43.37	.0233
MASS-WGHTD.						.91	22.71	2.22	81.64	71.66	9.97		

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .011 , MASS-WGHTD. = .011

MASS EMISSIONS :

	THC #/1000 #/HR	CO #/1000 #/HR	CO2 #/1000 #/HR	NOX #/1000 #/HR	NO #/1000 #/HR	NO2 #/1000 #/HR	SOX #/HR
AREA-WGHTD.	.05	.41	3123.	11.96	10.55	83.37	7.89
MASS-WGHTD.	.05	.37	3123.	12.03	10.56	83.45	7.89

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN S *****

ENGINE TYPE : J57-59W BP : 29.70 IN.HG IAT : 87.0 DEG.F FUEL : # 5 - JP-4 H/C RATIO(ATM) : 2.05 FUEL SULFUR : .05 %
ENGINE SN : P634272 TEST TYPE : B

***** MODE 5 - TAKE-OFF (THRUST = 11580 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PT3 = 42.0 PSIG PT5/7 = 81.9 IN.HG
EPR = .000 FUEL FLOW = 12300. #/HR PS2 = .00 IN.H2O AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

SAMPLE POINT NO LOCATION	TEMP. DEG.F	PLOT PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPHC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	SMOKE SN	W/A
1	694.6	22.1	.0012	1246.17	1.4843	58.38	281.94	2.48	16.88	10.37	6.51	67.00	.0233
2	773.6	27.4	.0012	1564.33	1.8490	68.84	369.11	3.14	21.53	12.66	8.87	62.00	.0233
3	1012.6	32.7	.0010	1910.96	1.9887	69.08	394.14	3.70	26.48	15.31	11.17	65.50	.0233
4	1025.0	34.7	.0011	1987.11	2.0880	30.18	350.89	3.40	30.28	19.76	10.50	75.00	.0233
5	.0	32.0	.0000	.00	.0000	20.65	339.26	2.85	29.19	19.68	9.31	58.00	.0233
AVERAGE : NUM.	876.4	29.2	.0011	1677.14	1.8525	56.62	354.02	3.18	23.79	14.53	9.26	67.37	.0233
MASS-WGHTD.						55.92	358.22	3.23	24.39	14.92	9.47		

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .016 , MASS-WGHTD. = .016

MASS EMISSIONS :

	THC #/1000#	CO #/1000#	NOX #/1000#	NO #/1000#	NO2 #/1000#	SUX #/HR
AREA-WGHTD.	2.00	24.64	21.87	2.41	1.47	18.14
MASS-WGHTD.	1.95	23.95	21.78	2.44	1.49	18.33
					.94	11.56
					.95	11.64
						12.29
						12.29

* MID-POINT - NOT INCLUDED IN AVERAGES

***** END RUN S *****

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** START RUN 6 *****

ENGINE TYPE : J57-59W
BP : 29.70 IN.HG
ENGINE SN : P634817
IAT : 88.0 DEG.F
FUEL : # 6 - JP-4
H/C RATIO(ATM) : 2.00
TEST TYPE : R
FUEL SULFUR : .05 %

***** MODE 1 - IDLE (THRUST = 200 #) *****

PT1 = .00 IN.H2O		PT2 = .00 IN.H2O		PS2 = .00 IN.H2O		PT3 = 16.7 PSIG		PT5/7 = 32.2 IN.HG				
EPR = .000		FUEL FLOW = 1200. #/HR		EXH.VEL FT/SEC		AIR FLOW = 0. #/HR		ACTUAL F/A RATIO = .000				
* SAMPLE POINT *	TEMP.	PTOT	DENS.	EXH.VEL	MASS FL.	THC	CO	CO2	NOX	NO	NO2	*--- SMOKE ---*
NO LOCATION	DEG.F	PSIA	(RH0)		(RH0*V)	PPMC	PPM	%	PPM	PPM	PPM	SN
												N/A
2	.0	15.4	.0000	.00	.0000	456.94	350.36	.90	7.10	.85	6.25	5.00
3	.0	15.6	.0000	.00	.0000	549.12	423.67	1.05	8.17	.84	7.33	6.00
4	.0	15.6	.0000	.00	.0000	435.85	368.31	.99	8.13	1.08	7.05	8.50
* 5	.0	15.6	.0000	.00	.0000	378.52	338.79	1.02	8.61	1.35	7.26	6.00
AVERAGE : NUM.		.0	.0000	.00	.0000	480.64	380.78	.58	7.80	.92	6.88	6.50
MASS-WGHTD.						.00	.00	.00	.00	.00	.00	.00

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .005 , MASS-WGHTD. = .000

MASS EMISSIONS :

	THC #/1000#	CO #/1000#	CO2 #/1000#	NOX #/1000#	NO #/1000#	N2 #/1000#	SUX #/HR
AREA-WGHTD.	51.56	71.32	2884.	2.40	.28	2.12	1.20
MASS-WGHTD.	.00	.00	0.	.00	.00	.00	1.20

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1626-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F06635-77-0216

***** CONT. RUN 6 *****

ENGINE TYPE : J57-S9M
BP : 29.70 IN.HG
IAT : 88.0 DEG.F
ENGINE SN : P634817
FUEL : # 6 - JP-4
H/C RATIO(ATM) : 2.00
TEST TYPE : B
FUEL SULFUR : .05 %

***** MODE 3 - INTERMED. (THRUST = 4570 #) *****

PT1 = .00 IN.H2O
EPR = .000
PT2 = .00 IN.H2O
FUEL FLOW = 3900. #/HR
PS2 = .00 IN.H2O
AIR FLOW = .00
PT3 = 33.7 PSIG
ACTUAL F/A RATIO = .000
PT5/7 = 44.4 IN.HG

* SAMPLE POINT * NO LOCATION	TEMP. DEG.F	POT. PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPHC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	*--- SMOKE ---* SN W/A
1	.0	17.1	.0000	.00	.0000	22.10	46.37	1.05	19.84	14.79	5.05	28.00
2	.0	19.3	.0000	.00	.0000	16.31	59.40	1.34	26.26	19.07	7.19	30.00
3	.0	20.7	.0000	.00	.0000	15.87	66.79	1.52	30.56	22.28	8.28	35.50
4	.0	20.7	.0000	.00	.0000	9.34	53.59	1.36	27.41	20.69	6.72	43.00
5	.0	19.8	.0000	.00	.0000	6.26	49.48	1.37	27.06	21.38	5.68	40.50
AVERAGE : NUM. MASS-WGHTD.	.0	19.4	.0000	.00	.0000	15.90	56.54	1.32	26.02	19.21	6.81	34.12
						.00	.00	.00	.00	.00	.00	.0232

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .006 , MASS-WGHTD. = .000

MASS EMISSIONS :

--- THC --- #/1000#	*--- CO ---* #/1000#	*--- CO2 ---* #/1000#	*--- NOX ---* #/1000#	*--- NO ---* #/1000#	*--- NO2 ---* #/1000#	* SOX * #/HR
1.37	8.52	3121.	6.44	4.76	1.69	3.90
.00	.00	0.	.00	.00	.00	3.90

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN 6 *****

ENGINE TYPE : J57-59W ENGINE SN : P634817 TEST TYPE : B
BP : 29.70 IN.HG IAT : 88.0 DEG.F FUEL : 6 - JP-4 H/C RATIO(ATM) : 2.00 FUEL SULFUR : .05 %

***** MODE 4 - MILITARY (THRUST = 9720 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PS2 = .00 IN.H2O PT3 = 42.1 PSIG PT5/7 = 67.9 IN.HG
EPR = .000 FUEL FLOW = 7900. #/HR AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

SAMPLE POINT #	TEMP. DEG.F	PTOT PSIA	DENS. (RHO)	EXH.VEL FT/SEC	MASS FL. (RHO*V)	THC PPHC	CO PPM	CO2 %	NOX PPM	NO PPM	NO2 PPM	SMOKE W/A
NO	LOCATION											
1	*	.0	.0000	.00	.0000	3.72	23.73	1.63	50.75	47.39	3.36	.0232
2	*	.0	.0000	.00	.0000	2.58	28.88	2.04	69.99	62.67	7.32	.0232
3	*	.0	.0000	.00	.0000	1.94	33.41	2.32	82.16	70.71	11.45	.0232
4	*	.0	.0000	.00	.0000	.24	29.75	1.92	71.68	61.84	10.04	.0232
5	*	.0	.0000	.00	.0000	.18	31.07	2.06	79.33	68.60	10.73	.0232
AVERAGE : NUM.		.0	.0000	.00	.0000	2.12	28.94	1.98	68.64	60.60	8.04	.0232
MASS-WGHTD.						.00	.00	.00	.00	.00	.00	

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .010 , MASS-WGHTD. = .000

MASS EMISSIONS :

THC #/1000#	CO #/1000#	CO2 #/1000#	NOX #/1000#	NO #/1000#	NO2 #/1000#	SOX #/HR
.12	2.92	3133.	11.37	10.04	1.33	7.89
MASS-WGHTD.	.00	0.	.00	.00	.00	7.89
AREA-WGHTD.	.97	23.1	89.82	79.29	10.52	
MASS-WGHTD.	.00	0.	.00	.00	.00	

* MID-POINT - NOT INCLUDED IN AVERAGES

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - MASS DATA CALCULATIONS

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

***** CONT. RUN 6 *****

ENGINE TYPE : J57-59W IAT : 88.0 DEG.F FUEL : # 6 - JP-4 H/C RATIO(ATM) : 2.00 FUEL SULFUR : .05 %
BP : 29.70 IN.HG ENGINE SN : P634817

***** MODE 5 - TAKE-OFF (THRUST = 13160 #) *****

PT1 = .00 IN.H2O PT2 = .00 IN.H2O PS2 = .00 IN.H2O PT5/7 = 81.9 IN.HG
EPR = .000 FUEL FLOW = 12100. #/HR AIR FLOW = 0. #/HR ACTUAL F/A RATIO = .000

* SAMPLE POINT *	TEMP.	PTOT	DENS.	EXH.VEL	MASS FL.	THC	CO	CO2	NOX	NO	NO2	* SMOKE *
NO	LOCATION	DEG.F	PSIA	FT/SEC	(RHO*V)	PPMC	PPM	%	PPM	PPM	PPM	W/A
1	*	-0	21.3	.0000	.00	63.76	308.31	2.74	16.25	9.88	6.37	51.00
2	*	-0	.0	.0000	.00	66.22	436.17	3.42	22.16	12.97	9.19	52.00
3	*	-0	28.9	.0000	.00	77.95	467.61	3.76	27.47	15.88	11.59	52.00
4	*	-0	34.6	.0000	.00	23.79	324.17	3.42	31.41	21.39	10.02	60.00
5	*	-0	30.9	.0000	.00	8.06	268.39	3.59	36.41	27.07	9.34	66.00
AVERAGE : NUM.		.0	28.3	.0000	.00	57.93	389.07	3.33	24.32	15.03	9.29	53.75
MASS-WGHTD.						.00	.00	.00	.00	.00	.00	.0232

CALCULATED F/A RATIOS FOR ABOVE AVERAGE CONCENTRATIONS : AREA-WGHTD.(NUM) = .017 , MASS-WGHTD. = .000

MASS EMISSIONS :

* THC *	* CO *	* NOX *	* NO *	* NO2 *	* SOX *
#/1000#	#/1000#	#/HR	#/1000#	#/1000#	#/HR
1.96	22.70	274.6	2.36	1.46	.90
.00	.00	.0	.00	.00	.00
AREA-WGHTD.	23.72	3097.	28.57	17.65	10.91
MASS-WGHTD.	.00	0.	.00	.00	.00
					12.09
					12.09

* MID-POINT - NOT INCLUDED IN AVERAGES

***** END RUN 6 *****

3FIN
STOP MASS

APPENDIX D
ENGINE TEST DATA

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - ENGINE TEST DATA

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

SCOTT TEST NUMBER 4, TYPE B

TEST DATE : 9/ 6/77

ENGINE 2, NUMBER 1

ENGINE TYPE & MODEL : J57-59W
ENGINE SERIAL # : P630584
TOTAL ENGINE TIME : 0 HRS.
PERFORMANCE TEST RESULTS : PASS

TEST LOCATION : LRAFB - ARK.
TEST CELL NUMBER : N6
TEST CELL OPERATOR : WM
SCOTT SUPERVISOR : FL
INSTRUMENT OPERATOR : PR
SMOKE OPERATOR : DO

AIR FLOW MEASUREMENT METHOD : NONE

TEST ENVIRONMENTAL CONDITIONS :

TEST TIME (MIL-TIME) : START FINISH
1350 1600
INLET AIR TEMP. (DEG.F) : 89.0
ATMOSPHERIC PRESS. (IN.HG) : 29.58
RELATIVE HUMIDITY (%) : 64
INLET AIR HUMIDITY - 0.0190
(6M H2O/6M DRY AIR) :

SAMPLE LINE :
FLOW RATE : 23 LPM
TEMPERATURE : 300 DEG.F
LENGTH : 100 FT.

FUEL ANALYSIS :
SAMPLE # : 4
TYPE : JP-4
WT.% CARBON : 85.55
WT.% HYDROGEN : 14.30
WT.% SULFUR : 0.07
H/C RATIO-ATM : 2.01
C/H RATIO-MASS : 5.98

TEST MODE	RATED POWER	THRUST #	FUEL FLOW #/HR	N1 SPEED RPM	N2 SPEED RPM	PT1 COTP IN.H2O	PT2 COTP IN.H2O	PS2 CISP IN.H2O	PT3 COTP PSIG	PT5/PT7 TOTP IN.HG	TT2 CIT DEG.F	TT5/TT7 EGT DEG.F	NOZZLE OPEN.
IDLE	2	200	1300	6634	6634				17.1	32.6		600	
INTERMED.	40	3750	3800	8579	8579				29.3	44.8		775	
MILITARY	100	9190	7900	9427	9427				44.8	68.2		1075	
TAKE-OFF	125	11400	12000	9517	9517				44.3	82.0		1100	

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - ENGINE TEST DATA

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT FOR 635-77-0216

SCOTT TEST NUMBER 5, TYPE B

TEST DATE : 9/ 7/77

ENGINE 2, NUMBER 2

ENGINE TYPE & MODEL : J57-59W
ENGINE SERIAL # : P634272
TOTAL ENGINE TIME : 0 HRS.
PERFORMANCE TEST RESULTS : PASS

TEST LOCATION : LRAFB - ARM.
TEST CELL NUMBER : NG
TEST CELL OPERATOR : WM
SCOTT SUPERVISOR : FL
INSTRUMENT OPERATOR : PR
SMOKE OPERATOR : DO

AIR FLOW MEASUREMENT METHOD : NONE

TEST ENVIRONMENTAL CONDITIONS :

TEST TIME (MIN-TIME) : START FINISH
INLET AIR TEMP. (DEG.F) : 1410 1610
ATMOSPHERIC PRESS. (IN.HG) : 87.0 87.0
RELATIVE HUMIDITY (%) : 29.70 29.70
INLET AIR HUMIDITY - 63 63
(GM H2O/GM DRY AIR) : 0.0176 0.0176

SAMPLE LINE :
FLOW RATE : 23 LPM
TEMPERATURE : 300 DEG.F
LENGTH : 100 FT.

FUEL ANALYSIS :
SAMPLE # : 5
TYPE : JP-4
WT.% CARBON : 85.53
WT.% HYDROGEN : 14.62
WT.% SULFUR : 0.05
H/C RATIO-ATM.: 2.05
C/H RATIO-MASS: 5.85

TEST MODE	RATED POWER	THRUST #	FUEL FLOW #/HR	N1 SPEED RPM	N2 SPEED RPM	PT1 COTP IN.H20	PT2 COTP IN.H20	PS2 CISP IN.H20	PT3 COTP PSIG	PT5/PT7 TOTP IN.HG	TT2 CIT DEG.F	TT5/TT7 EGT DEG.F	NOZZLE OPEN.
IDLE	2	250	1250	6405	6405	16.7	16.7	32.5	16.7	32.5	600	600	
INTERMED.	40	3460	3900	8529	8529	28.8	28.8	45.0	28.8	45.0	780	780	
MILITARY	100	9090	7900	9457	9457	43.5	43.5	68.8	43.5	68.8	1116	1116	
TAKE-OFF	125	11580	12300	9597	9597	42.0	42.0	81.9	42.0	81.9	1116	1116	

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - ENGINE TEST DATA

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

SCOTT TEST NUMBER 6, TYPE B

TEST DATE : 9/ 8/77

ENGINE 2, NUMBER 3

ENGINE TYPE & MODEL : J57-59W
ENGINE SERIAL # : P634817
TOTAL ENGINE TIME : 1759 HRS.
PERFORMANCE TEST RESULTS : PASS
AIR FLOW MEASUREMENT METHOD : NONE

TEST LOCATION : LRAFB - ARM.
TEST CELL NUMBER : NG
TEST CELL OPERATOR : WM
SCOTT SUPERVISOR : FL
INSTRUMENT OPERATOR : PR
SMOKE OPERATOR : AS

TEST ENVIRONMENTAL CONDITIONS :
TEST TIME (MIL. TIME) : START FINISH
INLET AIR TEMP. (DEG. F) : 1315 1500
ATMOSPHERIC PRESS. (IN. HG) : 88.0 88.0
RELATIVE HUMIDITY (%) : 29.70 29.70
INLET AIR HUMIDITY - 55 55
(6M H2O/6M DRY AIR) : 0.0159 0.0159

SAMPLE LINE :
FLOW RATE : 23 LPM
TEMPERATURE : 300 DEG. F
LENGTH : 100 FT.

FUEL ANALYSIS :
SAMPLE # : 6
TYPE : JP-4
WT. % CARBON : 85.59
WT. % HYDROGEN : 14.28
WT. % SULFUR : 0.05
H/C RATIO-ATM : 2.00
C/H RATIO-MASS : 5.99

TEST MODE	RATED POWER	THRUST #	FUEL FLOW #/HR	N1 SPEED RPM	N2 SPEED RPM	PT1 COTP IN. H2O	PT2 COTP IN. H2O	PS2 CISP IN. H2O	PT3 COTP PSIG	PT5/PT7 TOTP IN. HG	TT2 CIT DEG. F	TT5/TT7 EGT DEG. F	NOZZLE OPEN #
IDLE	2	200	1200	6385	8500				16.7	32.2		575	
INTERMED.	40	4570	3900	8500	8500				33.7	44.4		768	
MILITARY	100	9720	7900	9467	9467				42.1	67.9		1078	
TAKE-OFF	125	13160	12100	9627	9627				43.4	81.9		1090	

3FIN

STOP ENGEND

APPENDIX E
SMOKE EDIT REPORTS

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - SAMPLE POINT SMOKE DATA

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

** RUN	4 **	SAMPLE POINT	TEMP DEG.F	PRESS PSIA	FLOW CFM	VOLUME CF	W/A #/SQ-IN	SAMPLE REFL.	PAPER REFL.	SN
101		101	80.0	14.8	.50	.455	.0232	97.00	100.00	3.00
102		102	80.0	14.8	.50	.455	.0232	94.50	100.00	5.50
103		103	80.0	14.8	.50	.455	.0232	95.00	100.00	5.00
104		104	80.0	14.8	.50	.455	.0232	94.50	100.00	5.50
105		105	80.0	14.8	.50	.455	.0232	88.00	100.00	12.00
301		301	80.0	14.8	.50	.455	.0232	70.00	100.00	30.00
302		302	80.0	14.8	.50	.455	.0232	96.00	100.00	4.00
303		303	80.0	14.8	.50	.455	.0232	63.00	100.00	37.00
304		304	80.0	14.8	.50	.455	.0232	68.00	100.00	32.00
305		305	80.0	14.8	.50	.455	.0232	59.50	100.00	40.50
401		401	80.0	14.8	.50	.455	.0232	59.50	100.00	40.50
402		402	80.0	14.8	.50	.455	.0232	57.00	100.00	43.00
403		403	80.0	14.8	.50	.455	.0232	53.00	100.00	47.00
404		404	80.0	14.8	.50	.455	.0232	55.00	100.00	45.00
405		405	80.0	14.8	.50	.455	.0232	52.00	100.00	48.00
501		501	80.0	14.8	.50	.455	.0232	29.00	100.00	71.00
502		502	80.0	14.8	.50	.455	.0232	35.00	100.00	65.00
503		503	80.0	14.8	.50	.455	.0232	36.00	100.00	64.00
504		504	80.0	14.8	.50	.455	.0232	35.50	100.00	64.50

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 EDIT REPORT - SAMPLE POINT SMOKE DATA

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT F08635-77-0216

** RUN 5 **

SAMPLE POINT	TEMP DEG.F	PRESS PSIA	FLOW CFM	VOLUME CF	W/A #/SQ.IN	SAMPLE REFL.	PAPER REFL.	SN
101	78.0	14.8	.50	.455	.0233	88.00	100.00	12.00
102	78.0	14.8	.50	.455	.0233	94.00	100.00	6.00
103	78.0	14.8	.50	.455	.0233	93.00	100.00	7.00
104	78.0	14.8	.50	.455	.0233	91.50	100.00	8.50
105	78.0	14.8	.50	.455	.0233	93.50	100.00	6.50
301	78.0	14.8	.50	.455	.0233	81.00	100.00	19.00
302	78.0	14.8	.50	.455	.0233	72.00	100.00	28.00
303	78.0	14.8	.50	.455	.0233	67.00	100.00	33.00
304	78.0	14.8	.50	.455	.0233	58.00	100.00	42.00
305	78.0	14.8	.50	.455	.0233	54.00	100.00	46.00
401	78.0	14.8	.50	.455	.0233	63.00	100.00	37.00
402	78.0	14.8	.50	.455	.0233	56.50	100.00	43.50
403	78.0	14.8	.50	.455	.0233	54.00	100.00	46.00
404	78.0	14.8	.50	.455	.0233	53.00	100.00	47.00
405	78.0	14.8	.50	.455	.0233	49.50	100.00	50.50
501	78.0	14.8	.50	.455	.0233	33.00	100.00	67.00
502	78.0	14.8	.50	.455	.0233	38.00	100.00	62.00
503	78.0	14.8	.50	.455	.0233	34.50	100.00	65.50
504	78.0	14.8	.50	.455	.0233	25.00	100.00	75.00
505	78.0	14.8	.50	.455	.0233	42.00	100.00	58.00

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
EDIT REPORT - SAMPLE POINT SMOKE DATA

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216

** RUN 6 **

SAMPLE POINT	TEMP DEG.F	PRESS PSIA	FLOW CFM	VOLUME CF	W/A #/SO.IN	SAMPLE REFL.	PAPER REFL.	SN
101	80.0	14.8	.50	.455	.0232	80.00	100.00	20.00
102	80.0	14.8	.50	.455	.0232	95.00	100.00	5.00
103	80.0	14.8	.50	.455	.0232	94.00	100.00	6.00
104	80.0	14.8	.50	.455	.0232	91.50	100.00	8.50
105	80.0	14.8	.50	.455	.0232	94.00	100.00	6.00
301	80.0	14.8	.50	.455	.0232	72.00	100.00	28.00
302	80.0	14.8	.50	.455	.0232	70.00	100.00	30.00
303	80.0	14.8	.50	.455	.0232	64.50	100.00	35.50
304	80.0	14.8	.50	.455	.0232	57.00	100.00	43.00
305	80.0	14.8	.50	.455	.0232	59.50	100.00	40.50
401	80.0	14.8	.50	.455	.0232	56.00	100.00	44.00
402	80.0	14.8	.50	.455	.0232	60.00	100.00	40.00
403	80.0	14.8	.50	.455	.0232	62.00	100.00	38.00
404	80.0	14.8	.50	.455	.0232	55.00	100.00	45.00
405	80.0	14.8	.50	.455	.0232	53.00	100.00	47.00
501	80.0	14.8	.50	.455	.0232	49.00	100.00	51.00
502	80.0	14.8	.50	.455	.0232	48.00	100.00	52.00
503	80.0	14.8	.50	.455	.0232	48.00	100.00	52.00
504	80.0	14.8	.50	.455	.0232	40.00	100.00	60.00
505	80.0	14.8	.50	.455	.0232	34.00	100.00	66.00

3FIN

STOP SMOKIN

APPENDIX F
CONCENTRATION EDIT REPORTS

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216
CAL. DATE 7/22/77

REFERENCE CURVE TABLES - NON-LINEAR INSTRUMENTS

-----CO - HI-----				*-----CO - LOW-----*				*-----C02-----*			
PPHM		VOLTS	ANGLE	PPHM		VOLTS	ANGLE	% VOL		VOLTS	ANGLE
RANGE 1 :				RANGE 1 :				RANGE 1 :			
.00	.0000	1.5705		.00	.0000	1.5695		.00	.0000	1.4161	
245.00	.0650	1.5705		30.10	.0400	1.5694		1.46	.1950	1.4600	
895.00	.2130	1.5706		60.30	.0830	1.5694		3.20	.3500	1.4950	
1840.00	.3930	1.5706		78.40	.1060	1.5696		4.49	.4310	1.5145	
2400.00	.4940	1.5706		176.00	.2240	1.5696		6.09	.5110	1.5259	
4127.00	.7760	1.5707		245.00	.3000	1.5698		8.90	.6230	1.5357	
8100.00	1.2080	1.5707		614.00	.6100	1.5700		12.10	.7200	1.5432	
9600.00	1.3780	1.5707		895.00	.8340	1.5700		15.00	.7920	1.5487	
RANGE 2 :				RANGE 2 :				RANGE 2 :			
.00	.0000	1.5703		.00	.0000	1.5676		.00	.0000	1.3459	
176.00	.0710	1.5705		30.10	.1000	1.5674		1.46	.2850	1.4101	
245.00	.0900	1.5705		60.30	.2060	1.5674		3.20	.5100	1.4605	
614.00	.2070	1.5705		78.40	.2640	1.5677		4.49	.6290	1.4886	
895.00	.3000	1.5705		176.00	.5570	1.5679		6.09	.7450	1.5051	
1840.00	.5910	1.5705		245.00	.7460	1.5682		8.90	.9110	1.5193	
2400.00	.7460	1.5705		-1.00	-1.0000	.0000		12.10	1.0520	1.5342	
4127.00	1.2320	1.5705		-1.00	-1.0000	.0000		-1.00	-1.0000	.0000	
RANGE 3 :				RANGE 3 :				RANGE 3 :			
.00	.0000	1.5687		.00	.0000	1.5611		.00	.0000	1.3382	
30.10	.0510	1.5695		30.10	.3000	1.5606		1.46	.3320	1.3562	
176.00	.1840	1.5700		60.30	.6150	1.5611		3.20	.6950	1.3884	
245.00	.2300	1.5700		78.40	.7790	1.5624		4.49	.9020	1.4350	
614.00	.6030	1.5697		-1.00	-1.0000	.0000		-1.00	-1.0000	.0000	
895.00	.9610	1.5694		-1.00	-1.0000	.0000		-1.00	-1.0000	.0000	

** NOTES **

SPAN VOLTAGES ALREADY CORRECTED FOR ZERO GAS VOLTAGES.

A CONCENTRATION VALUE OF -1.0 INDICATES NO DATA.

SCOTT ENVIRONMENTAL TECHNOLOGY INC. REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 4, TYPE B 6/ 9/77 J 57 59# P63C58 LRAFB FIELD TEST 1

SET 1628-002-1077
 CALIBRATION DATA FOR PERIOD 1355 TO 1425
 REFERENCE CURVES CALIBRATION DATE : 7/22/77

NON-LINEAR INSTRUMENTS :									
	CO - HI	PERIOD START	PERIOD END	CO - LO	PERIOD START	PERIOD END	CO2	PERIOD START	PERIOD END
RANGE 1									
SPAN ADJ.FACTOR	.9912	.9912	.9912	.9945	.9945	.9945	1.0013	1.0013	1.0013
ZERO READING	.0146	.0146	.0146	.0207	.0207	.0207	.0104	.0104	.0104
RANGE 2									
SPAN ADJ.FACTOR	.9829	.9829	.9829	1.4195	1.4195	1.4195	1.1958	1.1958	1.1958
ZERO READING	.0177	.0177	.0177	.0455	.0455	.0455	.0155	.0155	.0155
RANGE 3									
SPAN ADJ.FACTOR	.8936	.8936	.8936	.9470	.9470	.9470	1.0245	1.0245	1.0245
ZERO READING	.0378	.0378	.0378	.1399	.1399	.1571	.0101	.0092	.0092

LINEAR INSTRUMENTS :									
	THC	PERIOD START	PERIOD END	NOX	PERIOD START	PERIOD END	NO	PERIOD START	PERIOD END
SPAN ADJ.FACTOR	1.1650	1.1650	1.1650	1.0082	1.0082	1.0082	1.0148	1.0148	1.0148
ZEROS FOR RANGES (THC) (NOX/NO)									
1	1.0	.1750	.0702	.8502	.8397	.8397	.8798	.4233	.4233
2	5.0	.0287	.0140	.1709	.2097	.2097	.0423	.1058	.1058
3	10.0	.0086	.0070	.0675	.0839	.0839	.0201	.0423	.0423
4	50.0	.0012	.0014	.0179	.0210	.0210	.0101	.0106	.0106
5	100.0	.0042	.0007	.0084	.0084	.0084	.0080	.0042	.0042
6	500.0	.0000	.0001	.0034	.0021	.0021	.0071	.0011	.0011
7	1000.0	.0000	.0001	.0009	.0008	.0008	.0009	.0004	.0004
8	5000.0	.0000	.0000	.0002	.0002	.0002	.0002	.0001	.0001

SPAN GAS CONCENTRATIONS :									
	THC-PPMC	NOX-PPM	NO-PPM	CO-HI-PPM	CO-LO-PPM	CO2-2	TOT.PRESS.FACT.	1.000	ADJ.
SPAN 1	24.48	19.70	19.70	245.00	78.40	4.49			
SPAN 2	417.00	90.40	90.40	2400.00	245.00	8.90			
SPAN 3	4620.00								

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J 57 59W # P63056 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 4,TYPE B 6/ 9/77 LRAFB FIELD TEST 1

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*- TEMP.-IF.-*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 1-01

SPAN/ZERO ADJ.	1.16	.0275	1.01	.1740	1.01	.0474	.89	.0363	1.42	.0455	1.02	.0100		
SAMPLE DATA :	5.00	.9177	10.00	.5508	10.00	.1104	3	.1948	2	.8363	3	.1661	.0	77.1
TIME : 1357		.9670		.5482		.1051		.1995		.8427		.1688	.0	76.8
PROBE POS.:		.9421		.5478		.0936		.1919		.8354		.1661	.0	76.4
11.68 IN.		.9380		.5528		.0946		.1964		.8204		.1688	.0	75.8
PRESS.: 14.53 PSIA		.9697		.5842		.0931		.1993		.8472		.1707	.0	75.6
AVERAGE :		.9469		.5568		.0994		.1964		.8364		.1681	.0	76.3
CONCENTRATION :	236.73	PPMC	5.57	PPMV	.99	PPMV	193.77	PPMV	280.58	PPMV	.72	% VOL	320.8	DEG.F

MODE-POINT : 1-02

SPAN/ZERO ADJ.	1.16	.0083	1.01	.1779	1.01	.0537	.89	.0389	1.42	.0455	1.02	.0100		
SAMPLE DATA :	10.00	.6819	10.00	.6651	10.00	.0728	3	.2419	2	1.0719	3	.2140	.0	74.6
TIME : 1400		.7078		.6962		.0721		.2453		1.0804		.2109	.0	72.8
PROBE POS.:		.6866		.6733		.0669		.2437		1.0910		.2102	.0	73.4
9.73 IN.		.6991		.6768		.0653		.2455		1.0840		.2086	.0	72.2
PRESS.: 15.26 PSIA		.7011		.6599		.0662		.2435		1.0681		.2148	.0	71.7
AVERAGE :		.6953		.6742		.0687		.2440		1.0791		.2117	.0	72.9
CONCENTRATION :	347.65	PPMC	6.74	PPMV	.69	PPMV	261.53	PPMV	.92	% VOL	381.2	DEG.F		

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 4,TYPE B 6/ 9/77 J 57 59W # P63058 LRAFB FIELD TEST 1

MODE-POINT : 1-03

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1402
 PROBE POS.:
 7.66 IN.
 PRESS.: 15.65 PSIA

AVERAGE :
 CONCENTRATION :

MODE-POINT : 1-04

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1404
 PROBE POS.:
 7.34 IN.
 PRESS.: 15.81 PSIA

AVERAGE :
 CONCENTRATION :

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
1.16 .0082	1.01 .1802	1.01 .0575	.89 .0392	.99 .0207	1.02 .0099	
10.00 .8813	10.00 .8365	10.00 .0741	3 .3006	1 .3636	3 .2588	.0 74.7
.8759	.8498	.0692	.3023	.3588	.2644	.0 74.9
.8563	.8459	.0688	.3007	.3619	.2570	.0 76.2
.8546	.8485	.0685	.3015	.3592	.2548	.0 75.7
.9317	.8749	.0666	.3055	.3642	.2623	.0 74.7
.8799	.8511	.0690	.3021	.3616	.2595	.0 75.2
439.97 PPMC	8.51 PPMV	.69 PPMV	327.12 PPMV	311.64 PPMV	1.13 % VOL	461.2 DEG.F
1.16 .0082	1.01 .0724	1.01 .0613	.89 .0396	.99 .0207	1.02 .0098	
10.00 .6656	25.00 .3766	10.00 .0634	3 .2689	1 .3440	3 .2803	.0 75.8
.7138	.3792	.0601	.2903	.3422	.2849	.0 76.1
.6959	.3749	.0592	.2959	.3394	.2772	.0 77.6
.7391	.3769	.0569	.2930	.3509	.2791	.0 76.3
.6688	.3721	.0550	.2890	.3477	.2791	.0 75.5
.6966	.3759	.0589	.2914	.3449	.2801	.0 76.3
348.32 PPMC	9.40 PPMV	.59 PPMV	315.43 PPMV	292.96 PPMV	1.22 % VOL	525.0 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 4, TYPE B 6/ 9/77 J 57 59W # P63058 LRAFB FIELD TEST 1

MODE-POINT : 1-05

SPAN/ZERO ADJ.	1.16	.0080	1.01	.0737	1.01	.0664	.89	.0400	.99	.0207	1.02	.0098			
SAMPLE DATA :	10.00	.6814	25.00	.3732	10.00	.0531	3	.2707	1	.3388	3	.2713			74.7
TIME : 1406		.6956		.3695		.0528		.2827		.3345		.2720			.0
PROBE POS. :		.6908		.3698		.0532		.2720		.3380		.2733			.0
-10 IN.		.7319		.3679		.0488		.2790		.3413		.2744			.0
PRESS. : 15.55 PSIA		.6854		.3649		.0531		.2691		.3401		.2713			.0
		.6800		.3684		.0529		.2688		.3380		.2748			.0
AVERAGE :		.6942		.3690		.0523		.2737		.3384		.2729			.0
CONCENTRATION :	347.09	PPMC	9.22	PPMV	.52	PPMV	295.69	PPMV	285.90	PPMV	1.19	% VOL	523.2	DEG.F	

MODE-POINT : 3-01

SPAN/ZERO ADJ.	1.16	.1247	1.01	.0753	1.01	.0308	.89	.0406	.95	.1481	1.02	.0097			
SAMPLE DATA :	1.00	.3059	25.00	.6615	25.00	.4626	3	.0780	3	.5001	3	.2482			.0
TIME : 1409		.2629		.6775		.4816		.0762		.5441		.2457			.0
PROBE POS. :		.2472		.6599		.4669		.0781		.5459		.2467			.0
11.66 IN.		.2311		.6663		.4779		.0746		.5876		.2455			.0
PRESS. : 16.03 PSIA		.2179		.6470		.4743		.0753		.5624		.2446			.0
AVERAGE :		.2530		.6625		.4727		.0764		.5980		.2461			.0
CONCENTRATION :	12.65	PPMC	16.56	PPMV	11.82	PPMV	51.85	PPMV	53.62	PPMV	1.07	% VOL	423.9	DEG.F	

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J 57 594 # P63058 USAF CONTRACT FOR 635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 4, TYPE B 6/ 9/77 LRAFB FIELD TEST 1

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-H1 ---*	*--- CO-L0 ---*	*--- CO2 ---*	*--- TEMP. --- F ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 3-02

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1411
 PROBE POS.:
 9.84 IN.
 PRESS.: 18.16 PSIA

AVERAGE :
 CONCENTRATION : 10.44 PPMC

MODE-POINT : 3-03

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1413
 PROBE POS.:
 7.68 IN.
 PRESS.: 20.46 PSIA

AVERAGE :
 CONCENTRATION : 14.11 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

1.16 .1184	1.01 .0763	1.01 .0321	.89 .0410	.95 .1492	1.02 .0096	
1.00 .2436	25.00 .9231	25.00 .6399	3 .0893	3 .6326	3 .3205	.0 77.9
.2091	.9320	.6337	.0931	.5926	.3216	.0 77.5
.1870	.9273	.6416	.0930	.6079	.3216	.0 77.4
.2030	.9301	.6361	.0944	.6213	.3205	.0 77.8
.2011	.9088	.6383	.0911	.6101	.3228	.0 77.0
.2088	.9242	.6379	.0922	.6129	.3214	.0 77.5
10.44 PPMC	23.11 PPMV	15.95 PPMV	67.29 PPMV	60.08 PPMV	1.41 % VOL	532.1 DEG.F
1.16 .1121	1.01 .0197	1.01 .0334	.89 .0413	1.42 .0455	1.02 .0096	
1.00 .2613	100.00 .2909	25.00 .7761	3 .1091	2 .4071	3 .3869	.0 76.2
.3658	.2883	.7646	.1076	.3978	.3855	.0 76.7
.2776	.2905	.7854	.1084	.3936	.3803	.0 75.8
.2573	.2879	.7570	.1049	.4126	.3820	.0 76.2
.2488	.2949	.7793	.1058	.4089	.3844	.0 75.3
.2822	.2905	.7725	.1072	.4040	.3838	.0 76.0
14.11 PPMC	29.05 PPMV	19.31 PPMV	83.22 PPMV	124.08 PPMV	1.70 % VOL	656.1 DEG.F

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT

SET 1628-002-1077
SCOTT TEST 4,TYPE B 6/ 9/77

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216
LRAFB FIELD TEST 1

J 57 59W # P63058

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP --- F ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 3-04

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1415

PROBE POS. :

4.3 IN.

PRESS. : 20.88 PSIA

AVERAGE :

CONCENTRATION : 3.04 PPMC

MODE-POINT : 3-05

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1416

PROBE POS. :

-.09 IN.

PRESS. : 19.92 PSIA

AVERAGE :

CONCENTRATION : .10 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT FOR 635-77-0216
 LRAFB

J 57 59M # P63058

6/ 9/77

4,TYPE B

SCOTT TEST

FIELD TEST 1

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- IEMP ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
1.16 .0828	1.01 .0206	1.01 .0105	.89 .0430	.95 .1550	1.02 .0093	
1.00 -.0706	100.00 .4672	100.00 .4376	.3 .0516	3 .1822	3 .3709	.0 78.2
-.0652	.4610	.4267	.0512	.1740	.3657	.0 78.1
-.0942	.4579	.4372	.0526	.1740	.3653	.0 78.6
-.1072	.4663	.4375	.0503	.1624	.3631	.0 78.2
-.1032	.4557	.4207	.0510	.1746	.3624	.0 78.1
-.0881	.4616	.4319	.0513	.1734	.3655	.0 78.2
.00 PPMC	46.16 PPMV	43.19 PPMV	30.36 PPMV	17.57 PPMV	1.61 % VOL	605.8 DEG.F

MODE-POINT : 4-01

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1421
 PROBE POS. :
 11.62 IN.
 PRESS. : 18.84 PSIA

AVERAGE :
 CONCENTRATION :

CALIBRATION DATA FOR PERIOD 1425 TO 1511

NON-LINEAR INSTRUMENTS :									
REFERENCE CURVES CALIBRATION DATE : 7/22/77									
		CO - HI		CO - LO		NOX		NO	
		PERIOD	PERIOD	PERIOD	PERIOD	PERIOD	PERIOD	PERIOD	PERIOD
		START	END	START	END	START	END	START	END
RANGE 1									
SPAN ADJ.FACTOR		.9912	.9912	.9945	.9945	.9945	.9945	1.0013	1.0013
ZERO READING		.0146	.0146	.0207	.0207	.0207	.0207	.0104	.0104
RANGE 2									
SPAN ADJ.FACTOR		.9829	.9829	1.4195	1.4195	1.4195	1.4195	1.1958	1.1958
ZERO READING		.0177	.0126	.0455	.0513	.0455	.0513	.0155	.0113
RANGE 3									
SPAN ADJ.FACTOR		.8936	.8936	.9470	.9470	.9470	.9470	1.0245	1.0245
ZERO READING		.0437	.0107	.1571	.0771	.1571	.0771	.0092	.0062

LINEAR INSTRUMENTS :									
		THC		NOX		NOX		NO	
		PERIOD	PERIOD	PERIOD	PERIOD	PERIOD	PERIOD	PERIOD	PERIOD
		START	END	START	END	START	END	START	END
SPAN ADJ.FACTOR									
		1.1650	1.1650	1.0082	1.0082	1.0082	1.0082	1.0148	1.0148
ZEROS FOR RANGES (THC) (NOX/NO)									
1	1.0	.0702	.2385	.8367	.8593	.4233	.3933		
2	5.0	.0140	.0407	.2097	.2148	.1058	.0983		
3	10.0	.0070	.0168	.0839	.0859	.0423	.0393		
4	50.0	.0014	.0041	.0210	.0215	.0106	.0098		
5	100.0	.0007	.0020	.0084	.0086	.0042	.0039		
6	500.0	.0001	.0004	.0021	.0021	.0011	.0010		
7	1000.0	.0001	.0002	.0008	.0009	.0004	.0004		
8	5000.0	.0000	.0000	.0002	.0002	.0001	.0001		

SPAN GAS CONCENTRATIONS :									
		THC-PPMC	NOX-PPM	NO-PPM	CO-HI-PPM	CO-LO-PPM	CO2-2		
SPAN 1	24.48	19.70	245.00	245.00	78.40	4.49		TOT.PRESS.FACT.	1.000, ADJ.
SPAN 2	417.00	90.40	2400.00	245.00	245.00	8.90		SAMPLE PROBE TYPE - SP	
SPAN 3	4620.00							THERMOCOUPLE TYPE - K	

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT SCOTT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-D216
LRAF8 FIELD TEST 1

J 57 59W # P63058

61 9177

SCOTT TEST 4, TYPE B

*---THC---	RNG	VOLTS
*---NOX---	RNG	VOLTS
*---NO---	RNG	VOLTS
*---CO-HI---	RNG	VOLTS
*---CO-LO---	RNG	VOLTS
*---CO2---	RNG	VOLTS
--TEMP--F--	INPUT	REFER

MODE-POINT : 4-02

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1926

PROBE POS.:

9.78 IN.

PRESS.: 23.34 PSIA

AVERAGE :

CONCENTRATION :

MODE-POINT : 4-03

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1428

PROBE POS.:

7.69 IN.

PRESS.: 28.56 PSIA

AVERAGE :

CONCENTRATION :

DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT F08635-77-0216
 LRAFB

J 57 59W # F63058

6/ 9/77

SCOTT TEST #TYPE B

FIELD TEST 1

---THC---	*---NOX---*	*---CO-HI---*	*---CO-LO---*	*---CO2---*	*---TEMP---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 4-04

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1432

PROBE POS. :

#39 IN.

PRESS. : 30.30 PSIA

AVERAGE :

CONCENTRATION :

MODE-POINT : 4-05

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1436

PROBE POS. :

#04 IN.

PRESS. : 27.25 PSIA

AVERAGE :

CONCENTRATION :

1.16 .0965	1.01 .0210	1.01 .0105	.89 .0386	.95 .1446	1.02 .0087	
1.00 .1564	100.00 .7838	100.00 .6793	3 .0674	3 .3368	3 .5360	0 77.4
.1553	.8004	.6824	.0662	.3190	.5298	0 77.4
.1573	.7985	.6889	.0685	.3167	.5355	0 77.8
.1575	.7831	.6739	.0682	.3366	.5320	0 77.3
.1535	.7959	.6838	.0678	.3407	.5271	0 77.3
.1647	.7921	.6741	.0681	.3311	.5262	0 77.9
.1575	.7923	.6804	.0677	.3302	.5311	0 77.5
7.87 PPMC	79.23 PPMC	68.04 PPMV	43.91 PPMV	33.03 PPMV	2.37 % VOL	1002.3 DEG.F

1.16 .1118	1.01 .0211	1.01 .0104	.89 .0356	.95 .1373	1.02 .0085	
1.00 .0965	100.00 .6692	100.00 .5751	3 .0694	3 .4288	3 .4588	0 77.5
.1294	.6784	.5822	.0684	.3966	.4622	0 76.9
.1340	.6783	.5802	.0682	.4058	.4631	0 77.4
.1334	.6682	.5761	.0669	.3929	.4612	0 76.8
.1316	.6661	.5742	.0687	.3846	.4591	0 76.8
.1250	.6721	.5775	.0683	.4017	.4609	0 77.1
6.25 PPMC	67.21 PPMC	57.75 PPMV	44.45 PPMV	39.81 PPMV	2.05 % VOL	956.8 DEG.F

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J 57 59# # P63058 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 4,TYPE B 6/ 9/77 LRAFB FIELD TEST 1

CALIBRATION DATA FOR PERIOD 1511 TO 1534
 REFERENCE CURVES CALIBRATION DATE : 7/22/77

NON-LINEAR INSTRUMENTS :

	CO - HI	CO - LO	CO2	PERIOD START	PERIOD END	PERIOD START	PERIOD END
RANGE 1							
SPAN ADJ.FACTOR	.9912	.9945	1.0013	1.0013	1.0013	1.0013	1.0013
ZERO READING	.0146	.0207	.0104	.0104	.0104	.0104	.0104
RANGE 2							
SPAN ADJ.FACTOR	.9829	1.4195	1.1958	1.4337	1.0982	1.0982	1.0982
ZERO READING	.0126	.0513	.0113	-.0002	.0113	.0113	.0113
RANGE 3							
SPAN ADJ.FACTOR	.8936	.9470	1.0245	.8936	1.1711	1.1711	1.1711
ZERO READING	.0107	.0771	.0062	.0051	.0059	.0059	.0059

LINEAR INSTRUMENTS :

	THC	NOX	NO	PERIOD START	PERIOD END	PERIOD START	PERIOD END
SPAN ADJ.FACTOR	1.1650	1.0082	1.0148	1.2760	1.1948	1.1948	1.1948
ZEROS FOR RANGES (THC) (NOX/NO)							
1 1.0	.2385	.8593	.3933	.9788	.2939	.2939	.2939
2 5.0	.0407	.2148	.0983	.2447	.0735	.0735	.0735
3 10.0	.0168	.0859	.0393	.0952	.0193	.0193	.0193
4 50.0	.0041	.0215	.0098	.0251	.0099	.0099	.0099
5 100.0	.0020	.0086	.0039	.0098	.0029	.0029	.0029
6 500.0	.0004	.0021	.0010	.0024	.0007	.0007	.0007
7 1000.0	.0002	.0009	.0004	.0010	.0003	.0003	.0003
8 5000.0	.0000	.0002	.0001	.0002	.0001	.0001	.0001

SPAN GAS CONCENTRATIONS :

	THC-PPM	NOX-PPM	NO-PPM	CO-HI-PPM	CO-LO-PPM	CO2-1
SPAN 1	24.48	19.70	19.70	245.00	78.40	4.49
SPAN 2	417.00	90.40	90.40	2400.00	245.00	8.90
SPAN 3	4620.00					

TOT.PRESS.FACT. 1.000, ADJ. CO
 SAMPLE PROBE TYPE - SP
 THERMOCOUPLE TYPE - K

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

THC	NOX	NO	CO-HI	CO-LO	CO2	TEMP
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 5-01

SPAN/ZERO ADJ.	1.15	.2407	1.03	.0218	1.03	.0098	.89	.0103	.94	.0714	1.04	.0062		
SAMPLE DATA :														
TIME : 1513	1.00	.1206	100.00	.6628	100.00	.3068	3	.2090	3	.5967*	3	.5380	.0	79.1
PROBE POS. :		.0757		.6663		.3177		.2191		.6565*		.5403	.0	78.8
11.56 IN.		.0607		.6471		.3012		.2351		1.0982*		.5373	.0	78.5
PRESS. : 21.28 PSIA		.0189		.6496		.3054		.2350		1.4839*		.5327	.0	78.2
AVERAGE :														
CONCENTRATION :	3.45	PPMC	65.64	PPMV	30.78	PPMV	237.95	PPMV	.0000	.00	PPMV	2.40	PPMV	727.8 DEG.F

MODE-POINT : 5-02

SPAN/ZERO ADJ.	1.15	.0413	1.03	.0867	1.03	.0378	.89	.0103	1.42	.0473	1.04	.0062		
SAMPLE DATA :														
TIME : 1513	5.00	.3671	25.00	.7809	25.00	.3409	3	.2922	2	1.2538*	3	.6668	.0	75.2
PROBE POS. :		.3737		.7522		.3334		.2992		1.9242*		.6515	.0	77.1
9.87 IN.		.3941		.7573		.3186		.3082		.9072*		.6520	.0	77.8
PRESS. : 26.30 PSIA		.3922		.7528		.3335		.3035		.9684*		.6602	.0	76.7
AVERAGE :														
CONCENTRATION :	95.44	PPMC	19.02	PPMV	8.29	PPMV	325.68	PPMV	.0000	.00	PPMV	3.00	PPMV	884.24 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP --- F ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 5-03

SPAN/ZERO ADJ.
SAMPLE DATA :
TIME : 1518
PROBE POS.:
7.79 IN.
PRESS.: 32.47 PSIA

AVERAGE :
CONCENTRATION : 113.44 PPMC

MODE-POINT : 5-04

SPAN/ZERO ADJ.
SAMPLE DATA :
TIME : 1520
PROBE POS.:
4.39 IN.
PRESS.: .00 PSIA

AVERAGE :
CONCENTRATION : 64.95 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

2FIN

STOP CONC

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216
CAL. DATE 7/22/77

SET 1628-002-1077
REFERENCE CURVE TABLES - NON-LINEAR INSTRUMENTS

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT

----- CO - HI -----				*----- CO - LOW -----*				*----- CO2 -----*									
PPMV		VOLTS		ANGLE		PPMV		VOLTS		ANGLE		VOLTS		ANGLE			
RANGE 1 :						RANGE 1 :						RANGE 1 :					
.00		.0000		1.5705		.00		.0000		1.5695		.00		1.4161			
245.00		.0650		1.5705		30.10		.0400		1.5694		1.46		1.4600			
895.00		.2130		1.5706		60.30		.0830		1.5694		3.20		1.4950			
1840.00		.3930		1.5706		78.40		.1060		1.5696		4.49		1.5145			
2400.00		.4940		1.5706		176.00		.2240		1.5696		6.09		1.5259			
4127.00		.7760		1.5707		245.00		.3000		1.5698		8.90		1.5357			
8100.00		1.2080		1.5707		614.00		.6100		1.5700		12.10		1.5432			
9600.00		1.3780		1.5707		895.00		.8340		1.5700		15.00		1.5487			
RANGE 2 :						RANGE 2 :						RANGE 2 :					
.00		.0000		1.5703		.00		.0000		1.5676		.00		1.3459			
176.00		.0710		1.5705		30.10		.1000		1.5674		1.46		1.4101			
245.00		.0900		1.5705		60.30		.2060		1.5674		3.20		1.4605			
614.00		.2070		1.5705		78.40		.2640		1.5677		4.49		1.4886			
895.00		.3000		1.5705		176.00		.5570		1.5679		6.09		1.5051			
1840.00		.5910		1.5705		245.00		.7460		1.5682		8.90		1.5193			
2400.00		.7460		1.5705		-1.00		-1.0000		.0000		12.10		1.5342			
4127.00		1.2320		1.5705		-1.00		-1.0000		.0000		-1.00		1.0520			
														.0000			
RANGE 3 :						RANGE 3 :						RANGE 3 :					
.00		.0000		1.5687		.00		.0000		1.5611		.00		1.3382			
30.10		.0510		1.5695		30.10		.3000		1.5606		1.46		1.3562			
176.00		.1840		1.5700		60.30		.6150		1.5611		3.20		1.3884			
245.00		.2300		1.5700		78.40		.7790		1.5624		4.49		1.4350			
614.00		.6030		1.5697		-1.00		-1.0000		.0000		-1.00		1.4000			
895.00		.9610		1.5694		-1.00		-1.0000		.0000		-1.00		.0000			

** NOTES **

SPAN VOLTAGES ALREADY CORRECTED FOR ZERO GAS VOLTAGES.
A CONCENTRATION VALUE OF -1.0 INDICATES NO DATA.

SCOTT ENVIRONMENTAL TECHNOLOGY INC. REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST S,TYPE B 7/ 9/77 J57 59N 4 P63427 LRAFB FIELD TEST 2

CALIBRATION DATA FOR PERIOD 1359 TO 1635

NON-LINEAR INSTRUMENTS : REFERENCE CURVES CALIBRATION DATE : 7/22/77

	CO - HI	CO - LO	CO2	PERIOD START	PERIOD END	PERIOD START	PERIOD END
RANGE 1							
SPAN ADJ.FACTOR	.9999	1.0571	1.0299	.9429	1.1732		
ZERO READING	.0196	.0178	.0110	.0307	.0110		
RANGE 2							
SPAN ADJ.FACTOR	1.0069	1.0570	1.0293	.8621	1.1921		
ZERO READING	.0249	.0427	.0164	.0427	.0082		
RANGE 3							
SPAN ADJ.FACTOR	.8388	1.0623	1.0320	.7732	1.2898		
ZERO READING	.0616	.1302	.0098	.1640	.0065		

LINEAR INSTRUMENTS :

	THC	NOX	NO	PERIOD START	PERIOD END	PERIOD START	PERIOD END
SPAN ADJ.FACTOR	.9502	1.1749	1.1588	1.2782	1.1902		
ZEROS FOR RANGES (THC) (NOX/NO)							
1	1.0	2.5					
2	5.0	10.0					
3	10.0	25.0					
4	50.0	100.0					
5	100.0	250.0					
6	500.0	1000.0					
7	1000.0	2500.0					
8	5000.0	10000.0					

SPAN GAS CONCENTRATIONS :

	THC-PPM	NOX-PPM	NO-PPM	CO-HI-PPM	CO-LO-PPM	CO2-2
SPAN 1	24.48	19.70	19.70	245.00	78.40	9.49
SPAN 2	417.00	90.40	90.40	2400.00	245.00	8.90
SPAN 3	4620.00					

TOT.PRESS.FACT. 1.000, ADJ. .00
 SAMPLE PROBE TYPE - SP
 THERMOCOUPLE TYPE - K

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 5, TYPE B. 7/ 9/77 J57 59W # P63427 LRAFB FIELD TEST 2

THC	NOX	NO	CO-HI	CO-LO	CO2	TEMP
RNG	RNG	RNG	RNG	RNG	RNG	INPUT
VOLTS	VOLTS	VOLTS	VOLTS	VOLTS	VOLTS	REFER

MODE-POINT : 1-01

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1359
 PROBE POS.:
 11.69 IN.
 PRESS.: 14.89 PSIA

AVERAGE :
 CONCENTRATION : 403.75 PPMC

MODE-POINT : 1-02

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1401
 PROBE POS.:
 9.90 IN.
 PRESS.: 15.19 PSIA

AVERAGE :
 CONCENTRATION : 566.79 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY SCOTT TEST 5, TYPE B 7/ 9/77 J57 59W # P63427 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT LRAFR FIELD TEST 2

MODE-POINT : 1-03

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1403

PROBE POS.:

7.64 IN.

PRESS.: 15.53 PSIA

AVERAGE :

CONCENTRATION :

MODE-POINT : 1-04

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1405

PROBE POS.:

4.30 IN.

PRESS.: 15.67 PSIA

AVERAGE :

CONCENTRATION :

--- RNG	THC VOLTS	*---* RNG	NOX VOLTS	*---* RNG	CO-HI VOLTS	*---* RNG	CO-LO VOLTS	*---* RNG	CO2 VOLTS	*---* RNG	TEMP. INPUT	*---* F. REFER
.95	.0017	1.18	.1861	1.16	.0450	.84	.0617	1.05	.0181	1.04	.0097	
50.00	.2971	10.00	.7932	10.00	.1676	3	.3870	1	.4672	3	.2479	.0
	.3071		.7941		.1636		.3899		.4715		.2478	.0
	.3125		.8040		.1583		.3924		.4707		.2448	.0
	.3083		.8005		.1551		.3929		.4730		.2453	.0
	.3121		.8038		.1522		.3943		.4730		.2477	.0
	.3074		.7991		.1594		.3913		.4711		.2467	.0
		7.99 PPMV		1.59 PPMV		419.61 PPMV		441.80 PPMV		1.07 % VOL		466.6 DEG.F
.95	.0017	1.18	.1871	1.16	.0451	.84	.0618	1.05	.0183	1.04	.0097	
50.00	.2720	10.00	.9110	10.00	.1604	3	.4059	1	.4875	3	.2658	.0
	.2792		.9055		.1562		.4099		.4893		.2647	.0
	.2804		.9011		.1527		.4088		.4880		.2614	.0
	.2742		.9237		.1536		.4085		.4857		.2645	.0
	.2840		.9062		.1494		.4105		.4893		.2675	.0
	.2780		.9095		.1545		.4087		.4880		.2648	.0
		694.91 PPMV		1.54 PPMV		436.74 PPMV		462.67 PPMV		1.15 % VOL		532.9 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT F08635-77-0216
 LRAFB

J57 59W # P63427

7/ 9/77

SCOTT TEST 5,TYPE B

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 1-05

SPAN/ZERO ADJ.	.94	.0017	1.18	.1873	1.16	.0451	.84	.0613	1.05	.0184	1.04	.0096	
SAMPLE DATA :													
TIME : 1406	50.00	.2132	10.00	.9643	10.00	.1580	3	.3807	1	.4560	3	.2713	.0
PROBE POS. :		.2127		.9646		.1502		.3923		.4573		.2738	.0
-.02 IN.		.2129		.9684		.1486		.3789		.4586		.2751	.0
PRESS. : 15.42 PSIA		.2106		.9613		.1406		.3839		.4587		.2725	.0
		.2117		.9284		.1366		.3766		.4578		.2741	.0
AVERAGE :		.2122		.9575		.1468		.3825		.4577		.2734	.0
CONCENTRATION :	530.53 PPMC		9.57 PPMV		1.47 PPMV		410.85 PPMV		425.35 PPMV		1.19 % VOL		547.1 DEG.F

MODE-POINT : 3-01

SPAN/ZERO ADJ.	.94	.0378	1.18	.0203	1.16	.0221	.84	.0619	1.04	.1337	1.05	.0096	
SAMPLE DATA :													
TIME : 1409	5.00	.1027	100.00	.1978	25.00	.6050	3	.0847	3	.3872	3	.2543	.0
PROBE POS. :		.0893		.1928		.6007		.0862		.3978		.2536	.0
11.55 IN.		.0885		.1926		.6029		.0857		.4006		.2549	.0
PRESS. : 16.38 PSIA		.0863		.1921		.5941		.0898		.3738		.2500	.0
		.0770		.1914		.5934		.0882		.3941		.2501	.0
AVERAGE :		.0888		.1934		.5992		.0869		.3907		.2526	.0
CONCENTRATION :	22.19 PPMC		19.34 PPMV		14.98 PPMV		62.01 PPMV		38.77 PPMV		1.10 % VOL		453.3 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT FOR 635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST S,TYPE B 7/ 9/77 J57 59# # P63427 LRAFB FIELD TEST 2

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*- TEMP.- F.-*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 3-02

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1411
 PROBE POS.:
 9.87 IN.
 PRESS.: 18.17 PSIA

AVERAGE :
 CONCENTRATION : 18.20 PPMC

MODE-POINT : 3-03

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1413
 PROBE POS.:
 7.67 IN.
 PRESS.: 20.32 PSIA

AVERAGE :
 CONCENTRATION : 18.52 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

.94 .0378	1.18 .0204	1.16 .0105	.84 .0619	1.04 .1343	1.05 .0095	
5.00 .0712	100.00 .2606	100.00 .2004	3 .0992	3 .5267	3 .3180	.0 76.9
.0774	.2606	.1981	.1033	.5356	.3186	.0 77.2
.0719	.2576	.1954	.1012	.5391	.3134	.0 77.2
.0755	.2610	.1971	.1034	.5325	.3166	.0 77.4
.0680	.2588	.1970	.1023	.5277	.3170	.0 77.3
.0728	.2597	.1976	.1019	.5323	.3167	.0 77.2
18.20 PPMC	25.97 PPMV	19.76 PPMV	77.49 PPMV	52.11 PPMV	1.39 ± VOL	549.7 DE6.F

.94 .2060	1.18 .0205	1.16 .0106	.84 .0620	1.04 .1349	1.05 .0095	
1.00 .3663	100.00 .3216	100.00 .2414	3 .1111	3 .6275	3 .3730	.0 79.0
.3756	.3171	.2336	.1100	.6189	.3694	.0 78.7
.3697	.3147	.2390	.1124	.6320	.3734	.0 78.3
.3770	.3200	.2353	.1137	.6228	.3748	.0 77.8
.3436	.3202	.2400	.1120	.6143	.3723	.0 78.2
.3704	.3187	.2379	.1113	.6231	.3726	.0 78.4
18.52 PPMC	31.87 PPMV	23.79 PPMV	88.37 PPMV	61.14 PPMV	1.65 ± VOL	663.8 DE6.F

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J57 59# # P63427 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST S,TYPE B 7/ 9/77 LRAFB FIELD TEST 2

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 3-04

SPAN/ZERO ADJ. .94 .2059 1.18 .0206 1.16 .0106 .84 .0620 1.03 .1354 1.06 .0095
 SAMPLE DATA :
 TIME : 1414
 PROBE POS.:
 4.26 IN.
 PRESS.: 20.94 PSIA
 AVERAGE :
 CONCENTRATION : 8.95 PPMC 32.68 PPMV 25.59 PPMV 78.33 PPMV 50.80 PPMV 1.64 ± VOL 710.7 DEG.F

MODE-POINT : 3-05

SPAN/ZERO ADJ. .94 .2059 1.19 .0206 1.16 .0106 .84 .0620 1.03 .1358 1.06 .0094
 SAMPLE DATA :
 TIME : 1415
 PROBE POS.:
 4.06 IN.
 PRESS.: 19.80 PSIA
 AVERAGE :
 CONCENTRATION : 5.92 PPMC 30.89 PPMV 25.13 PPMV 78.70 PPMV 47.36 PPMV 1.58 ± VOL 709.0 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 5,TYPE B 7/ 9/77 J57 59W # P63427 LRAFB FIELD TEST 2

MODE-POINT : 4-01

SPAN/ZERO ADJ.	.93	.2057	1.19	.0208	1.16	.0106	.84	.0621	1.03	.1368	1.06	.0094		
SAMPLE DATA :	1.00	.0301	100.00	.5631	100.00	.5134	3	.0759	3	.1457	3	.3766	.0	75.9
TIME : 1418		.0258		.5625		.5264		.0764		.1617		.3781	.0	75.6
PROBE POS.:		.0300		.5673		.5232		.0761		.1575		.3767	.0	75.2
11.65 IN.		.0318		.5628		.5160		.0751		.1492		.3724	.0	76.2
PRESS.: 19.26 PSIA		.0162		.5585		.5178		.0774		.1532		.3715	.0	75.2
AVERAGE :		.0268		.5628		.5194		.0762		.1535		.3750	.0	75.6
CONCENTRATION :	1.34	PPMC	56.28	PPMV	51.94	PPMV	51.00	PPMV	15.57	PPMV	1.66	% VOL	635.3	DEG.F

MODE-POINT : 4-02

SPAN/ZERO ADJ.	.93	.2057	1.18	.0209	1.16	.0106	.84	.0621	1.03	.1370	1.06	.0094		
SAMPLE DATA :	1.00	.0255	100.00	.7531	100.00	.7083	3	.0825	3	.2035	3	.4894	.0	77.7
TIME : 1419		.0281		.7545		.7065		.0827		.2171		.4913	.0	78.3
PROBE POS.:		.0277		.7442		.6924		.0823		.2221		.4901	.0	78.4
9.89 IN.		.0197		.7454		.6872		.0852		.2309		.4870	.0	78.6
PRESS.: 23.19 PSIA		.0259		.7422		.6889		.0825		.2336		.4867	.0	78.7
AVERAGE :		.0254		.7479		.6967		.0830		.2214		.4889	.0	78.3
CONCENTRATION :	1.27	PPMC	74.79	PPMV	69.67	PPMV	58.17	PPMV	22.35	PPMV	2.18	% VOL	798.1	DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-C216
LRAFB FIELD TEST 2

SET 1628-002-1077

J57 59# # P63427

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT

SCOTT TEST 5,TYPE B

7/ 9/77

*---THC---	*---NOX---	*---CO-HI---	*---CO-LO---	*---CO2---	*---TEMP---
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
.93 .2057	1.19 .0209	.84 .0621	1.02 .1374	1.07 .0093	
1.00 .0074	100.00 .9735	3 .0921	3 .2797	3 .5756	.0 77.0
.0031	.9695	.0919	.2965	.5764	.0 76.3
.0100	.9693	.0937	.2999	.5717	.0 77.1
.0080	.9596	.0943	.2967	.5712	.0 76.3
.0034	.9845	.0955	.3128	.5718	.0 74.4
.0064	.9713	.0935	.2971	.5733	.0 76.2
.32 PPMC	97.13 PPMV	68.64 PPMV	29.82 PPMV	2.58 VOL	973.7 DEG.F

MODE-POINT : 4-03

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1420

PROBE POS.:

7.68 IN.

PRESS.: 28.54 PSIA

AVERAGE :

CONCENTRATION :

MODE-POINT : 4-04

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1421

PROBE POS.:

4.38 IN.

PRESS.: 30.08 PSIA

AVERAGE :

CONCENTRATION :

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J57 59# # P63427 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 5,TYPE B 7/ 9/77 LRAFB FIELD TEST 2

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 4-05

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1422
 PROBE POS.:
 -02 IN.
 PRESS.: 27.38 PSIA

AVERAGE :
 CONCENTRATION :

MODE-POINT : 5-01

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1505
 PROBE POS.:
 11.71 IN.
 PRESS.: 20.33 PSIA

AVERAGE :
 CONCENTRATION :

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT F08635-77-0216
 LRAFB FIELD TEST 2

J57 59W # F63427

7/ 9/77

SCOTT TEST 5,TYPE B

MODE-POINT : 5-02

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1506

PROBE POS. :

9.94 IN.

PRESS. : .00 PSIA

AVERAGE :

CONCENTRATION :

MODE-POINT : 5-03

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1506

PROBE POS. :

7.76 IN.

PRESS. : .00 PSIA

AVERAGE :

CONCENTRATION :

--- THC ---	*--- NOX ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
.89 .0127	1.22 .0236	.83 .0633	1.01 .0234	1.14 .0084	
10.00 .1448	100.00 .2186	3 .3458	1 .5673*	3 .6919	.0 79.9
.1436	.2114	.3584	.7783*	.6863	.0 79.0
.1386	.2130	.3633	.8968*	.6873	.0 78.9
.1288	.2178	.3724	.9716*	.6932	.0 79.3
.1327	.2157	.3727	1.0542*	.6892	.0 77.5
.1377	.2153	.3625	.0000	.6896	.0 78.9
68.84 PPMC	21.53 PPMV	390.72 PPMV	.00 PPMV	3.17 & VOL	773.6 DEG.F
.89 .0127	1.22 .0236	.83 .0633	1.01 .0234	1.14 .0084	
10.00 .1378	100.00 .2724	3 .3417	1 .5526*	3 .7925	.0 77.2
.1433	.2622	.3578	.7592*	.7903	.0 76.2
.1421	.2657	.3723	.9345*	.7862	.0 75.8
.1347	.2629	.3794	1.0470*	.7859	.0 75.4
.1329	.2611	.3871	1.1339*	.7839	.0 75.7
.1382	.2648	.3677	.0000	.7878	.0 76.1
69.08 PPMC	26.48 PPMV	395.96 PPMV	.00 PPMV	3.73 & VOL	1012.6 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT F08635-77-0216
 LRAFB

J57 59W # P63427

7/ 9/77

SCOTT TEST 5,TYPE B

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 5-04

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1512
 PROBE POS.:
 4.50 IN.
 PRESS.: 30.63 PSIA
 AVERAGE :
 CONCENTRATION : 30.18 PPMC

MODE-POINT : 5-05

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1514
 PROBE POS.:
 4.07 IN.
 PRESS.: 32.40 PSIA
 AVERAGE :
 CONCENTRATION : 20.65 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

3FIN

STOP CONC

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216
CAL. DATE 7/22/77

REFERENCE CURVE TABLES - NON-LINEAR INSTRUMENTS

----- CO - HI -----				*----- CO - LOW -----*				*----- CO2 -----*			
PPMV		VOLTS		PPMV		VOLTS		VOLTS		VOLTS	
ANGLE		ANGLE		ANGLE		ANGLE		ANGLE		ANGLE	
RANGE 1 :				RANGE 1 :				RANGE 1 :			
.00	.0000	1.5705	1.5705	.00	.0000	1.5695	1.5695	.00	.0000	1.4161	1.4161
245.00	.0650	1.5705	1.5705	30.10	.0400	1.5694	1.5694	1.46	.1950	1.4600	1.4600
895.00	.2130	1.5706	1.5706	60.30	.0830	1.5694	1.5694	3.20	.3500	1.4950	1.4950
1840.00	.3930	1.5706	1.5706	78.40	.1060	1.5696	1.5696	4.49	.4310	1.5145	1.5145
2400.00	.4940	1.5706	1.5706	176.00	.2240	1.5696	1.5696	6.09	.5110	1.5259	1.5259
4127.00	.7760	1.5707	1.5707	245.00	.3000	1.5698	1.5698	8.90	.6230	1.5357	1.5357
8100.00	1.2080	1.5707	1.5707	614.00	.6100	1.5700	1.5700	12.10	.7200	1.5432	1.5432
9600.00	1.3780	1.5707	1.5707	895.00	.8340	1.5700	1.5700	15.00	.7920	1.5487	1.5487
RANGE 2 :				RANGE 2 :				RANGE 2 :			
.00	.0000	1.5703	1.5703	.00	.0000	1.5676	1.5676	.00	.0000	1.3459	1.3459
176.00	.0710	1.5705	1.5705	30.10	.1000	1.5674	1.5674	1.46	.2850	1.4101	1.4101
245.00	.0900	1.5705	1.5705	60.30	.2060	1.5674	1.5674	3.20	.5100	1.4605	1.4605
614.00	.2070	1.5705	1.5705	78.40	.2640	1.5677	1.5677	4.49	.6290	1.4886	1.4886
895.00	.3000	1.5705	1.5705	176.00	.5570	1.5679	1.5679	6.09	.7450	1.5051	1.5051
1840.00	.5910	1.5705	1.5705	245.00	.7460	1.5682	1.5682	8.90	.9110	1.5193	1.5193
2400.00	.7460	1.5705	1.5705	-1.00	-1.0000	.0000	.0000	12.10	1.0520	1.5342	1.5342
4127.00	1.2320	1.5705	1.5705	-1.00	-1.0000	.0000	.0000	-1.00	-1.0000	.0000	.0000
RANGE 3 :				RANGE 3 :				RANGE 3 :			
.00	.0000	1.5687	1.5687	.00	.0000	1.5611	1.5611	.00	.0000	1.3382	1.3382
30.10	.0510	1.5695	1.5695	30.10	.3000	1.5606	1.5606	1.46	.3320	1.3562	1.3562
176.00	.1840	1.5700	1.5700	60.30	.6150	1.5611	1.5611	3.20	.6950	1.3884	1.3884
245.00	.2300	1.5700	1.5700	78.40	.7790	1.5624	1.5624	4.49	.9020	1.4350	1.4350
614.00	.6030	1.5697	1.5697	-1.00	-1.0000	.0000	.0000	-1.00	-1.0000	.0000	.0000
895.00	.9610	1.5694	1.5694	-1.00	-1.0000	.0000	.0000	-1.00	-1.0000	.0000	.0000

** NOTES **

SPAN VOLTAGES ALREADY CORRECTED FOR ZERO GAS VOLTAGES.

A CONCENTRATION VALUE OF -1.0 INDICATES NO DATA.

SCOTT ENVIRONMENTAL TECHNOLOGY INC. REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 6, TYPE B 8/ 9/77 J59 59W # P63481 LRAFB FIELD TEST 3

SET 1628-002-1077

CALIBRATION DATA FOR PERIOD 1326 TO 1605

REFERENCE CURVES CALIBRATION DATE : 7/22/77

NON-LINEAR INSTRUMENTS :

	CO - HI	CO - LO	CO2
	PERIOD START	PERIOD START	PERIOD START
	END	END	END
RANGE 1			
SPAN ADJ.FACTOR	.9896	.9522	1.0532
ZERO READING	.0276	.0122	-99.0000
RANGE 2			
SPAN ADJ.FACTOR	.9916	.3341	1.0695
ZERO READING	.0386	.0628	.0092
RANGE 3			
SPAN ADJ.FACTOR	.8893	.8117	1.1171
ZERO READING	.1017	.1944	.0068

LINEAR INSTRUMENTS :

	THC	NOX	NO
	PERIOD START	PERIOD START	PERIOD START
	END	END	END
SPAN ADJ.FACTOR	.9887	1.0118	1.0071
ZEROS FOR RANGES (THC) (NOX/NO)			
1	1.0	1.0	1.0
2	5.0	5.0	5.0
3	10.0	10.0	10.0
4	50.0	50.0	50.0
5	100.0	100.0	100.0
6	500.0	500.0	500.0
7	1000.0	1000.0	1000.0
8	5000.0	5000.0	5000.0

SPAN GAS CONCENTRATIONS :

	THC-PPMC	NOX-PPM	NO-PPM	CO-HI-PPM	CO-LO-PPM	CO2-3
SPAN 1	24.48	19.70	19.70	245.00	78.40	4.49
SPAN 2	417.00	90.40	90.40	2400.00	245.00	8.90
SPAN 3	4620.00					

TOT.PRESS.FACT. 1.000, ADJ. .00
 SAMPLE PROBE TYPE - SP
 THERMOCOUPLE TYPE - K

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J59 59W # P63481 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 6, TYPE B 8/ 9/77 LRAFB FIELD TEST 3

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. --- F ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 1-02

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1333
 PROBE POS.:
 9.73 IN.
 PRESS.: 15.41 PSIA

AVERAGE :
 CONCENTRATION : 456.94 PPMC

MODE-POINT : 1-03

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1334
 PROBE POS.:
 7.70 IN.
 PRESS.: 15.64 PSIA

AVERAGE :
 CONCENTRATION : 549.12 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

.99 .0034	1.02 .0223	1.02 .0204	.89 .1028	.96 .0128	1.12 .0053	
50.00 .1821	10.00 .7146	10.00 .0879	3 .3558	1 .3950	3 .2133	-0 77.5
.1826	.7024	.0867	.3589	.3959	.2135	-0 77.8
.1789	.7231	.0857	.3593	.3971	.2157	-0 78.1
.1833	.7063	.0830	.3594	.3971	.2143	-0 77.9
.1871	.7036	.0835	.3617	.3985	.2140	-0 78.6
.1828	.7100	.0854	.3590	.3967	.2141	-0 78.0
456.94 PPMC	7.10 PPMV	.85 PPMV	387.16 PPMV	352.16 PPMV	.93 VOL	.0 DEG.F
.99 .0034	1.02 .0226	1.02 .0203	.89 .1029	.96 .0128	1.12 .0053	
50.00 .2159	10.00 .8191	10.00 .0857	3 .4399	1 .4595	3 .2493	-0 78.5
.2224	.8166	.0833	.4393	.4587	.2507	-0 78.4
.2154	.8200	.0814	.4377	.4559	.2489	-0 79.6
.2218	.8205	.0836	.4407	.4565	.2469	-0 79.2
.2226	.8106	.0848	.4435	.4586	.2486	-0 78.7
.2196	.8174	.0838	.4403	.4579	.2489	-0 78.9
549.12 PPMC	8.17 PPMV	.84 PPMV	467.06 PPMV	425.62 PPMV	1.08 VOL	.0 DEG.F

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 6, TYPE B 8/ 9/77 J59 59W # P63481 LRAFB FIELD TEST 3

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 1-04

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1335
 PROBE POS.:
 4.44 IN.
 PRESS.: 15.65 PSIA

AVERAGE :
 CONCENTRATION :
 MODE-POINT : 1-05

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1336
 PROBE POS.:
 3.32 IN.
 PRESS.: 15.59 PSIA

AVERAGE :
 CONCENTRATION :

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

.99 .0034	1.02 .0231	1.02 .0203	.88 .1031	.95 .0129	1.12 .0052	
50.00 .1694	10.00 .8096	10.00 .1115	3 .3833	1 .4111	3 .2359	-0 76.9
.1717	.8172	.1088	.3871	.4131	.2375	-0 75.7
.1738	.8078	.1065	.3899	.4104	.2368	-0 75.8
.1797	.8104	.1067	.3866	.4123	.2329	-0 73.7
.1771	.8197	.1086	.3898	.4130	.2320	-0 75.2
.1743	.8129	.1084	.3874	.4120	.2350	-0 75.5
435.85 PPMC	8.13 PPMV	1.08 PPMV	415.71 PPMV	370.19 PPMV	1.02 VOL	.0 DEG.F
.99 .0034	1.02 .0236	1.02 .0203	.88 .1033	.95 .0130	1.12 .0052	
50.00 .1505	10.00 .8545	10.00 .1402	3 .3605	1 .3871	3 .2402	-0 74.3
.1503	.8547	.1377	.3600	.3866	.2404	-0 75.2
.1558	.8799	.1335	.3637	.3878	.2426	-0 75.2
.1515	.8529	.1318	.3621	.3867	.2399	-0 76.6
.1489	.8618	.1322	.3606	.3862	.2401	-0 76.4
.1514	.8608	.1351	.3614	.3869	.2406	-0 75.5
378.52 PPMC	8.61 PPMV	1.35 PPMV	389.56 PPMV	340.65 PPMV	1.05 VOL	.0 DEG.F

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY USAF CONTRACT FOR 635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 6, TYPE B 8/ 9/77 J59 59W # P63481 LRAFB FIELD TEST 3

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 3-01

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1336
 PROBE POS.:
 11.41 IN.
 PRESS.: 17.07 PSIA

AVERAGE :
 CONCENTRATION : 22.10 PPMC

MODE-POINT : 3-02

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1337
 PROBE POS.:
 9.63 IN.
 PRESS.: 19.27 PSIA

AVERAGE :
 CONCENTRATION : 16.31 PPMC

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

.99	.2352	1.02	.0146	1.02	.0127	.88	.1033	.90	.1176	1.12	.0052		
1.00	.5156	25.00	.8214	25.00	.6147	3	.0892	3	.5045	3	.2572		
	.4701		.7954		.5857		.0889		.5023		.2483		78.8
	.4396		.7809		.5926		.0865		.4862		.2469		78.9
	.4085		.7858		.5844		.0850		.4890		.2481		77.3
	.3765		.7850		.5807		.0867		.4822		.2449		77.0
													77.7
	.4421	19.84 PPMV	.7937	14.79 PPMV	.5916	62.33 PPMV	.0873	48.34 PPMV	.4926	1.08 % VOL	.2491		77.9
													.0 DEG.F
.99	.2356	1.02	.0043	1.02	.0079	.88	.1034	.90	.1179	1.12	.0052		
1.00	.3506	100.00	.2635	100.00	.1919	3	.0981	3	.6275	3	.3128		76.5
	.3383		.2612		.1924		.0983		.6258		.3150		77.0
	.3283		.2614		.1893		.0997		.6241		.3145		75.9
	.3034		.2637		.1901		.0994		.6265		.3119		75.9
	.3101		.2632		.1898		.1008		.6308		.3071		75.3
	.3262	26.26 PPMV	.2626	19.07 PPMV	.1907	74.90 PPMV	.0995	62.53 PPMV	.6269	1.37 % VOL	.3122		76.1
													.0 DEG.F

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT SCOTT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216
LRAF8 FIELD TEST 3

SCOTT TEST 6, TYPE B

81 9177

J59 59W # P63481

MODE-POINT : 3-03

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1339

PROBE POS.:

7.53 IN.
PRESS.: 20.67 PSIA

AVERAGE :

CONCENTRATION :

MODE-POINT : 3-04

SPAN/ZERO ADJ.

SAMPLE DATA :

TIME : 1341

PROBE POS.:

4.36 IN.
PRESS.: 20.71 PSIA

AVERAGE :

CONCENTRATION :

DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-0216
LRAFB

J59 59W # P63481

SET 1628-002-1077

8/ 9/77

6,TYPE B

SCOTT TEST

*-- TEMP. - F. -
INPUT REFER

-- CO2 --
RNG VOLTS

-- CO-L0 --
RNG VOLTS

-- CO-HI --
RNG VOLTS

-- NO --
RNG VOLTS

-- NOX --
RNG VOLTS

-- TMC --
RNG VOLTS

1.13 .0051
3 .3196
3170
3134
3203
3203
3181
1.40 ± VOL

.89 .1207
3 .5185
5285
5305
5232
5346
5271
51.60 PPMV

.88 .1042
3 .0901
0930
0919
0937
0900
0917
66.86 PPMV

1.03 .0079
100.00 .2145
2129
2144
2133
2139
2138
21.38 PPMV

1.03 .0045
100.00 .2707
2704
2697
2694
2726
2706
27.06 PPMV

.99 .2391
1.00 .1206
1299
1193
1277
1283
1252
6.26 PPMC

.99 .2402
1.00 .0771
0702
0657
0717
0672
0744
3.72 PPMC

1.13 .0050
3 .3757
3755
3775
3719
3758
3753
1.66 ± VOL

.89 .1216
3 .2534
2489
2625
2650
2632
2588
26.04 PPMV

.88 .1045
3 .0676
0691
0681
0669
0658
0675
43.72 PPMV

1.03 .0079
100.00 .4737
4763
4754
4708
4734
4739
47.39 PPMV

1.03 .0045
100.00 .5107
5105
5080
5068
5018
5075
50.75 PPMV

.99 .2402
1.00 .0771
0702
0657
0717
0672
0744
3.72 PPMC

1.13 .0050
3 .3757
3755
3775
3719
3758
3753
1.66 ± VOL

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
 USAF CONTRACT F08635-77-0216
 LRAFB

J59 59W # P63481

8/ 9/77

SCOTT TEST 6,TYPE B

FIELD TEST 3

MODE-POINT : 4-02

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1344
 PROBE POS.:
 9.92 IN.
 PRESS.: 24.80 PSIA
 AVERAGE :
 CONCENTRATION : 2.58 PPMC

MODE-POINT : 4-03

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1345
 PROBE POS.:
 7.68 IN.
 PRESS.: 29.32 PSIA
 AVERAGE :
 CONCENTRATION : 1.94 PPMC

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
.99 .2402	1.03 .0045	1.03 .0079	.88 .1045	.89 .1216	1.13 .0050	
1.00 .0534	100.00 .6923	100.00 .6230	3 .0738	3 .3031	3 .4717	-1 76.3
.0534	.7074	.6340	.0787	.3084	.4650	-1 76.3
.0572	.7008	.6245	.0794	.3088	.4683	-1 75.2
.0451	.7026	.6263	.0778	.3170	.4639	-1 75.9
.0489	.6964	.6258	.0784	.3285	.4627	-1 76.9
.0516	.6999	.6267	.0776	.3132	.4663	-1 76.1
2.58 PPMC	69.99 PPMV	62.67 PPMV	52.98 PPMV	31.39 PPMV	2.07 % VOL	.0 DEG.F
.99 .2410	1.03 .0046	1.04 .0079	.88 .1047	.89 .1223	1.13 .0050	
1.00 .0371	100.00 .8262	100.00 .7192	3 .0892	3 .3603	3 .5236	.0 78.6
.0387	.8279	.7124	.0896	.3529	.5256	.0 78.8
.0377	.8223	.7132	.0928	.3638	.5236	.0 78.4
.0401	.8173	.6944	.0922	.3665	.5241	.0 79.3
.0405	.8144	.6964	.0917	.3664	.5313	.0 79.1
.0388	.8216	.7071	.0911	.3620	.5256	.0 78.8
1.94 PPMC	82.16 PPMV	70.71 PPMV	66.19 PPMV	36.06 PPMV	2.35 % VOL	417.7 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC. SET 1628-002-1077 REPORT DATE 10/27/77
 USAF TURBINE ENGINE EMISSIONS INVENTORY J59 59# # P63481 USAF CONTRACT F08635-77-0216
 CONCENTRATION EDIT REPORT SCOTT TEST 0,TYPE B 8/ 9/77 LPAFB FIELD TEST 3

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. --- F ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER

MODE-POINT : 4-04

SPAN/ZERO ADJ.	.99	.2632	1.08	.0059	1.09	.0078	.86	.1101	.87	.1402	1.14	.0043		
SAMPLE DATA :	1.00	.0059	100.00	.7162	100.00	.6145	3	.0827	3	.3332	3	.4392		
TIME : 1420		.0019		.7108		.6149		.0798		.3198		.4390		77.2
PROBE POS. :		.0062		.7168		.6153		.0803		.3204		.4374		77.0
4.34 IN.		.0031		.7262		.6229		.0819		.3176		.4404		77.1
PRESS. : 29.66 PSIA		.0067		.7138		.6143		.0809		.3154		.4390		76.8
														76.4
AVERAGE :		.0048		.7168		.6164		.0811		.3213		.4390		76.9
CONCENTRATION :		.24 PPMC		71.68 PPMV		61.64 PPMV		56.30 PPMV		32.17 PPMV		1.95 % VOL		.0 DEG.F

MODE-POINT : 4-05

SPAN/ZERO ADJ.	.99	.2640	1.08	.0059	1.09	.0076	.86	.1103	.87	.1408	1.14	.0043		
SAMPLE DATA :	1.00	.0004	100.00	.7992	100.00	.6898	3	.0840	3	.3294	3	.4718		77.9
TIME : 1421		.0015		.7895		.6864		.0898		.3335		.4692		77.7
PROBE POS. :		.0016		.7907		.6845		.0847		.3324		.4717		78.8
2.23 IN.		.0094		.7956		.6878		.0836		.3428		.4671		79.7
PRESS. : 28.26 PSIA		.0076		.7917		.6816		.0841		.3413		.4649		79.2
AVERAGE :		.0035		.7933		.6860		.0852		.3359		.4689		78.7
CONCENTRATION :		.18 PPMC		79.33 PPMV		68.60 PPMV		60.33 PPMV		33.58 PPMV		2.09 % VOL		1394.9 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/27/77
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 LRAFB

J59 59# # P63481

8/ 9/77

SCOTT TEST 6,TYPE B

FIELD TEST 3

MODE-POINT : 5-01

SPAN/ZERO ADJ.
 SAMPLE DATA :

TIME : 1426
 PROBE POS.:
 11-69 IN.
 PRESS.: 21.32 PSIA

AVERAGE :
 CONCENTRATION :

MODE-POINT : 5-02

SPAN/ZERO ADJ.
 SAMPLE DATA :

TIME : 1427
 PROBE POS.:
 9-82 IN.
 PRESS.: .00 PSIA

AVERAGE :
 CONCENTRATION :

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- CO2 ---*	*--- TEMP. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
.99 .0214	1.08 .0061	1.10 .0078	.86 .1111	.72 .0169	1.14 .0042	
10.00 .1298	100.00 .1711	100.00 .1063	3 .2215	1 .2648*	3 .6166	.1 79.4
.1236	.1628	.1031	.2522	.2804*	.6141	.1 78.9
.1280	.1639	.0975	.3013	.3532*	.6111	.1 79.8
.1245	.1604	.0950	.3204	.5214*	.6108	.1 78.9
.1316	.1546	.0922	.3359	.6167*	.6070	.1 78.2
.1275	.1625	.0988	.2863	.0000	.6119	.1 79.0
63.76 PPMC	16.25 PPMV	9.88 PPMV	309.73 PPMV	.00 PPMV	2.77 ± VOL	.0 DEG.F
.99 .0215	1.08 .0062	1.10 .0078	.86 .1113	.71 .0170	1.14 .0041	
10.00 .1378	100.00 .2309	100.00 .1344	3 .3722	1 .5161*	3 .7448	.1 78.2
.1391	.2228	.1290	.4016	.7992*	.7424	.1 77.0
.1301	.2196	.1299	.4142	.9158*	.7354	.1 77.2
.1389	.2164	.1260	.4249	.9916*	.7421	.1 77.4
.1163	.2184	.1291	.4368	1.0381*	.7338	.1 76.7
.1324	.2216	.1297	.4099	.0000	.7397	.1 77.3
66.22 PPMC	22.16 PPMV	12.97 PPMV	437.92 PPMV	.00 PPMV	3.45 ± VOL	.0 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
 USAF TURBINE ENGINE EMISSIONS INVENTORY
 CONCENTRATION EDIT REPORT

SET 1628-002-1077

REPORT DATE 10/21/77
 USAF CONTRACT F08635-77-0216
 LRAFB

J59 59W # P63481

8/ 9/77

FIELD TEST 3

SCOTT TEST 6,TYPE B

MODE-POINT : 5-03

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1429
 PROBE POS.:
 7.64 IN.
 PRESS.: 28.90 PSIA

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-H1 ---*	*--- CO-L0 ---*	*--- CO2 ---*	*--- TEMP.-F. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
.99 .0216	1.09 .0062	1.10 .0078	.86 .1115	.71 .0171	1.14 .0041	
10.00 .1603	100.00 .2821	100.00 .1620	3 .4203	1 .7402*	3 .8011	-1 78.3
.1537	.2769	.1609	.4304	.9018*	.8012	-1 78.1
.1506	.2729	.1591	.4405	1.0214*	.8056	-1 78.4
.1604	.2727	.1569	.4570	1.1113*	.7887	-1 78.0
.1546	.2689	.1550	.4660	1.1817*	.7919	-1 78.5
AVERAGE : 77.95 PPMC	27.47 PPMV	15.88 PPMV	469.45 PPMV	.0000	.7977	-1 78.3
CONCENTRATION :				.00 PPMV	3.79 ± VOL	.0 DEG.F

MODE-POINT : 5-04

SPAN/ZERO ADJ.
 SAMPLE DATA :
 TIME : 1435
 PROBE POS.:
 4.14 IN.
 PRESS.: 34.59 PSIA

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-H1 ---*	*--- CO-L0 ---*	*--- CO2 ---*	*--- TEMP.-F. ---*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
.99 .0219	1.09 .0065	1.11 .0078	.85 .1125	.68 .0176	1.15 .0040	
10.00 .0755	100.00 .2918	100.00 .1875	3 .2786	1 .2883*	3 .7119	-1 78.5
.0349	.3324	.2402	.3033	.5708*	.7618	-1 77.5
.0435	.3150	.2140	.3033	.7487*	.7494	-1 78.0
.0438	.3173	.2143	.3069	.8252*	.7319	-0 77.7
.0402	.3140	.2135	.3129	.8668*	.7417	-0 77.2
AVERAGE : 23.79 PPMC	31.41 PPMV	21.39 PPMV	325.92 PPMV	.0000	.7393	-1 77.8
CONCENTRATION :				.00 PPMV	3.45 ± VOL	.0 DEG.F

** NOTE ** DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

SCOTT ENVIRONMENTAL TECHNOLOGY INC.
USAF TURBINE ENGINE EMISSIONS INVENTORY
CONCENTRATION EDIT REPORT SCOTT

SET 1628-002-1077

REPORT DATE 10/27/77
USAF CONTRACT F08635-77-Q216
LRAF8 FIELD TEST 3

J59 59W # P63481

81 9177

SCOTT TEST 6, TYPE B

--- THC ---	*--- NOX ---*	*--- NO ---*	*--- CO-HI ---*	*--- CO-LO ---*	*--- C02 ---*	*-- TEMP.- F.--*
RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	RNG VOLTS	INPUT REFER
1.00 .3238	1.19 .0095	1.23 .0077	.81 .1249	.31 .0238	1.18 .0023	
SAMPLE DATA :						
TIME : 1555						
PROBE POS.: #3 IN.	100.00 .3710 .3650 .2708 .2718 .2669 .3614 .3589	100.00 .2795 .2708 .2718 .2669 .2645	3 .2277 .2482 .2454 .2634 .2726	1 .4269* .5967* .6910* .8229* .9051*	3 .7684 .7663 .7667 .7745 .7742	-0 80.6 -0 80.1 -0 80.4 -0 80.8 -0 80.7
PRESS.: 30.93 PSIA						
AVERAGE :						
CONCENTRATION :	36.41 PPMV	27.07 PPMV	270.22 PPMV	.0000 .00 PPMV	.7700 3.62 VOL	-0 80.5 .0 DEG.F

DATA MARKED WITH AN ASTERISK (*) NOT INCLUDED IN AVERAGE

AFIN

STOP CONC

APPENDIX G

RINGELMANN OPACITY OBSERVATIONS

Ringelmann observations were taken during the J57-59W emission tests by a qualified Air Force observer. The Method 9 procedure was used to make the Ringelmann readings except for two variations. The plume was observed for only two seconds at a point ten meters directly aft of the engines exhaust nozzle. The plume would normally be allowed to build up and a Ringelmann reading is taken of the maximum plume opacity. The turbine engine exhaust plume dissipated very rapidly. In order to measure the maximum plume opacity, readings could only be taken for two-second time periods. In addition, the maximum opacity occurred ten meters aft of exhaust nozzle for all power modes because the plume was detached from the source. The Ringelmann observations were made at this point.

The Ringelmann data is presented in Table 6-3. Atmospheric data was made at the base weather station located 1.5 kilometers from the test site. All readings were taken against a bluish-white sky.

TABLE 6-3. J57-59W OPACITY MEASUREMENTS (RINGELMANN)

TEST NO. 4			TEST NO. 6		
Engine Mode	Atmospheric Conditions Cond. Value	Average Opacity (Percent)	Engine Mode	Atmospheric Conditions Cond. Value	Average Opacity (Percent)
Idle	Temp 28 ⁰ C	5	Idle	Temp 25 ⁰ C	3
	Rel Hum 41%			Rel Hum 90%	
	Wind 0.9m/s			Wind 7.2 m/s	
	Clouds 40%			Clouds 100%	
Military	Temp 28 ⁰ C	16	Military	Temp 25 ⁰ C	15
	Rel Hum 40%			Rel Hum 90%	
	Wind 0.9m/s			Wind 7.2 m/s	
	Clouds 40%			Clouds 100%	
After Burner With Water Injected	Temp 28 ⁰ C	51	After Burner With Water Injected	Temp 25 ⁰ C	40
	Rel Hum 40%			Rel Hum 90%	
	Wind 0.9m/s			Wind 7.2m/s	
	Clouds 40%			Clouds 100%	

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